The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 142, NO. 4 — CHICAGO, ILLINOIS — JANUARY 28, 1950

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DETECTION OF CANCER OF THE CERVIX UTERI

Evaluation of Comparative Exfoliative Cytologic Diagnosis: A Study of 10,000 Cases

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The vaginal smear method developed by Papanicolaou for the detection of carcinoma has found a great number of ardent supporters but has received a certain amount of adverse criticism as well. The original technic of aspiration from the posterior fornix [1] has been replaced by other methods, such as direct aspiration from the cervical os, scraping of the squamocolumnar junction with a specially designed spatula [2] or by the insertion of a cotton applicator into the cervical canal. The criteria for the recognition of malignant cells have been extensively described.[3] However, there is some difference of opinion on the advantage of this method over biopsy with regard to accuracy and on its value or feasibility as a screening and diagnostic procedure. These various problems were thoroughly investigated for a period of three years by a study of routine vaginal smears from 10,000 women.

INVESTIGATIVE PROCEDURE AND METHOD

The procedure was first used on all patients attending the University Hospital clinics. Facilities were later made available to physicians who desired to screen their patients. A good cross section of the population of all social strata was maintained throughout the investigation. The slides were sent to the Department of Cytology for staining and diagnosis. When malignant cells or atypical cells suggestive of cancer were found, a diagnostic curettage, cervical biopsy and endocervical curettage were requested for confirmation. The histologic sections were evaluated in the Department of Pathology independently, and results were compared after the diagnosis in each case was made.

The smears were obtained by inserting an ordinary cotton applicator about ½ to ¾ inch (1.27 to 1.91 cm.) into the cervical canal. By twirling the applicator a few times against the squamocolumnar junction we thought it possible to recover any cancer cells which might be present in that or nearby regions. In each case an additional smear from the posterior fornix of the vaginal wall was obtained. The slides were fixed at once in a solution of equal parts of ether and 95 per cent alcohol for at least ten minutes. After their removal from the fixative, and immediately before the occurrence of drying, a drop or two of glycerin was released on the slide, which was then covered by another clean slide and mailed in this condition to the laboratory for staining.[4] The staining methods of Papanicolaou [5] and Schorr [6] were used, and a modified Best's carmine stain was employed.[7]

In order to maintain simplicity and to secure the utmost collaboration from physicians, the methods of direct aspiration from the cervix and that of the surface biopsy were not used. Furthermore, it was feared that scraping of the squamocolumnar junction with a spatula would denude the cervix of the cancer-bearing area and thereby leave insufficient evidence for confirmation by biopsy.

TERMINOLOGY

Smears were classified according to the method of Papanicolaou in classes 1, 2, 3, 4 and 5. Classes 1 and 2 are considered negative, class 3 equivocal and classes 4 and 5 as positive for cancer.

In histologic examination of surgical material the pathologic changes as related to cancer are classified in four groups:

1. Borderline changes may be defined as the presence of epithelium with some intraepithelial anaplasia, particularly that associated with epidermal metaplasia or leukoplakia in which the changes are not sufficient to warrant a diagnosis of cancer but are presumptively precancerous or represent the borders of a preexisting cancer which may not be present in the biopsy specimen.

Aided by a grant from the American Cancer Society.
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With the technical assistance of Mrs. Sophia Bamford, M.S., and the clerical assistance and statistical compilation of Miss Juanita Sirmans, A.B.
Read in a Symposium on Carcinoma of the Cervix before the Section on Obstetrics and Gynecology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1949.

1. Papanicolaou, G. N., and Traut, H. F.: Diagnostic Value of Vaginal Smears in Carcinoma of Uterus, Am. J. Obst. & Gynec. 42:193, 1941.

2. Ayre, J. E.: Selective Cytology Smear for Diagnosis of Cancer, Am. J. Obst. & Gynec. 53:609, 1947.

3. (a) Fremont-Smith, M.; Graham, R. M., and Meigs, J. V.: Early Diagnosis of Cancer by Study of Exfoliated Cells, J. A. M. A. 128:469 (Oct. 16) 1948. (b) Fremont-Smith, M.; Graham, R. M., and Meigs, J. V.: The Cytologic Method in the Diagnosis of Cancer, New England J. Med. 238:179, 1948. (c) Lombard, H. L.; Middleton, M., Warren, S., and Gates, O.: Use of the Vaginal Smear as a Screening Test, ibid. 239:317, 1948. (d) Wiles, J. B., and Hellwig, C. A.: Evaluation of Papanicolaou's Method of Cancer Diagnosis, Am. J. Clin. Path. 18:283, 1948. (e) Scheffey, L. C.; Rakoff, A. E., and Hoffman, J.: An Evaluation of the Vaginal Smear Method for the Diagnosis of Uterine Cancer, Am. J. Obst. & Gynec. 56:453, 1948. (f) Hauptman, E.: The Cytologic Features of Carcinomas as Studied by Direct Smears, Am. J. Path. 24:1199, 1948. (g) Foote, F. W., and Li, H.: Smear Diagnosis of In Situ Carcinoma of the Cervix, ibid. 26:335, 1948. (h) Scapier, J.: Diagnosis of Cancer by the Papanicolaou Smear Method, Am. M. Woman's A. J. 2:139, 1948. (i) Papanicolaou, G. N.: The Cell Smear Method of Diagnosing Cancer, Am. J. Pub. Health 38:202, 1948. (j) Papanicolaou, G. N., and Traut, H. F.: Diagnosis of Uterine Cancer by the Vaginal Smear, New York The Commonwealth Fund, 1943. (k) Gates, O., and Warren, S.: A Handbook for the Diagnosis of Cancer of the Uterus by the Use of Vaginal Smears, Cambridge, Mass., Harvard University Press, 1947.

4. Ayre, J. E., and Dakin, E.: Cervical Cytology Test in Cancer Diagnosis: Glycerin Technic for Mailing, Canad. M. A. J. 54:484, 1946.

5. Papanicolaou, G. N.: New Procedure for Staining Vaginal Smears, Science 95:438, 1942.

6. Shorr, E.: New Technic for Staining Vaginal Smears: Single Differential Stain, Science 94:545, 1941.

7. Nieburgs, H. E., and Greenblatt, R. B.: The Significance of Specific Estrogenic, Progestogenic and Androgenic Smears in Menstrual Disorders and in Pregnancy, South. M. J. 41:972, 1948.

2. Preinvasive carcinoma is one in which atypical epithelium characteristic of cancer is noted, with this epithelium confined to the natural surfaces. Extension into the glands is not considered invasion in our laboratory.

3. Covert invasive cancer is one which is invasive, with the area of invasion confined to the junctional endocervix so that the cancer was not apparent on physical examination.

4. Overt invasive cancer is one with definite penetration and ulceration of the vaginal surface of the cervix; because of its appearance on physical examination, the lesion was considered clinically cancer.

RESULTS

A total of 10,000 women were investigated, in most instances by one examination, although in others repeated endocervical smears were taken. This required an additional study of 2,330 slides. Positive diagnoses were made according to the classification of Papanicolaou. However, an attempt was made to assign as few cases as possible to the equivocal class 3 and to change smears of this class into either the negative category of class 2 or the positive class 4. This was partly accomplished by a thorough study of the various cell types. It was thus possible to identify certain morphologic changes characteristic of preinvasive cancer [8] and to transfer smears with such cells, which ordinarily belong to class 3, into class 4 or even class 5.

Notwithstanding this, however, class 3 in our series was found to include a great number of confirmed cancers. We therefore have considered class 3 a positive group, and when class 3 smears were followed by negative biopsies they were listed as false positive. All percentages are given in relation to the total number of patients except when otherwise indicated.

The total number of cases with a positive cytologic diagnosis (class 3, 4 or 5) was 332, or 3.3 per cent. Of these, 234 patients were investigated, with the result that 185, or 1.8 per cent, of 10,000 had positive biopsies while 49, or 0.5 per cent, had false positive results. As far as it is known there are only 5, or 0.05 per cent, false negative results—consisting of 2 cases of endometrial cancer, 2 cases of preinvasive squamous cell carcinoma of the cervix and 1 of invasive. The value of this method for screening is evident. In the examination of 10,000 women, in only 332 was there indication for further study. The figure 3.3 per cent clearly approximates the incidence of uterine cancer. It is furthermore important to emphasize that of the 234 patients investigated a carcinoma was found in 76 per cent. Borderline changes were observed in the biopsies of 3 per cent. A large proportion of the remaining 21 per cent showed such evidence of cancer in the smear that further investigations have been advocated for these as well as for the borderline cases.

Sixty-eight of the 185 positive cases were of preinvasive cancer and 7 were borderline. If the borderline lesions, which are considered at least precancerous, are included in the cancer series, 41 per cent of the cancers of the uterus were detected in a known curable stage. In 57 of these the smears were actually read as preinvasive because of the morphologic state of the exfoliated cells. Of all those with positive cytologic diagnosis 78 patients, or 42 per cent, had no symptoms related to cancer (table 1). The total number of 332 positive smears from the 10,000 patients were divided into 130, or 1.3 per cent, of class 3 and 202, or 2 per cent, of classes 4 and 5.

Biopsies of 72 patients with class 3 smears investigated gave the following results. In 43, or 60 per cent, a cancer or borderline changes were observed. There were 29 false positive results, or 40 per cent. The large number of carcinomas which were found in this group is evidence of the need to investigate all patients with class 3 smears. Of the 13 preinvasive cancers in this series, 8 were diagnosed as such by the endocervical smear. In this group 16 patients were free of any symptoms related to cancer (table 2).

Of the 202 cases with positive diagnoses in class 4 or 5, 162 were investigated. This revealed a total of 142 cases, or 88 per cent, with cancer or borderline changes, which are subdivided into 86 cases of invasive cancer, 55 preinvasive and 4 borderline. In this series there were only 20 false positive results, or 12 per cent. Of these 55 preinvasive cancers, 49 were diagnosed as such by the structure of exfoliated cells. In this group 62 patients had no symptoms of cancer (table 3).

CARCINOGENESIS IN RELATION TO AGE

The following observation was made on the incidence of abnormal changes in the cervical epithelium according to different age groups (table 4). This relationship of age to the stage of cervical cancer confirms the earlier investigations of Pund and Auerbach.[9] Their data were compiled from the examination of 1,200 unselected cervices mostly from hysterectomies performed for reasons other than cancer.

DETECTION OF PREINVASIVE CANCER OF THE CERVIX

In a previous article we called attention to a specific cell in smears from cervices with preinvasive cancer.[8] The recognition of these specific cells facilitated greatly the detection of cervical cancer in the incipient phase by endocervical smears. The morphologic appearance is extremely diverse and can be distinguished only by comparison. The main distinguishing features for cells

TABLE 1.—*Analysis of Positive Cytologic Diagnoses Among 10,000 Patients Studied by Vaginal Smear Method*

Total number of positive smears		332
Total number of patients investigated		234
Total number of positive biopsies	185, or 1.8 %	
Total number of negative biopsies	49, or 0.5 %	
Total number of false negatives	5, or 0.05%	
Total number of preinvasive carcinomas	68, or 0.7 %	
Total number of invasive carcinomas	106, or 1.05%	
Total number of endometrial cancers	4, or 0.04%	
Total number of borderline cases	7, or 0.07%	
Total number of asymptomatic cases	78, or 0.8 %	

TABLE 2.—*Positive Cytologic Smears of Class 3*

	Pathologic Diagnosis and Follow-Up							
Cytologic Diagnosis	Overt Invasive	Covert Invasive	Preinvasive	Borderline	Endometrial	Total Positive	Total Negative	Not Investigated
Preinvasive, 13	1	..	8	..	..	9	1	3
Invasive....117	22	2	5	3	3	34	28	55
Total:....130	23	2	13	3	3	43	29	58
Asymptomatic	3	..	10	3	..	..	..	..

8. Nieburgs, H. E., and Pund, E. R.: Specific Malignant Cells Exfoliated from Preinvasive Cancer of the Cervix Uteri, Am. J. Obst. & Gynec., 58:532, 1949.

9. Pund, E. R., and Auerbach, S. H.: Preinvasive Carcinoma of the Cervix Uteri, J. A. M. A. 132:960 (July 30) 1946.

from preinvasive cancer are the unusually large size and greater amount of cytoplasm, which generally stains a typical yellow-orange. The nuclei may be small and hyperchromatic with lack of detail and irregular nuclear membrane, or large, foamy and agranular with well defined or ill defined borders. Conversely, there may be nuclei with distinct borders and a particular type of granularity unlike that found in invasive cancer. The bizarre cell structure of invasive cancer cells is absent (figure). Exfoliated cells from preinvasive cancer generally appear singly or in loose groups but rarely in adherent clusters. In addition there is usually a striking predominance of normal cells, and the cells of the vaginal smear may be of the cornified type although the patient may be in the secretory phase of the cycle or of postmenopausal age. In 2 instances a partly preinvasive and partly invasive cervical cancer was diagnosed as such from the smear by the previously outlined criteria. The difference in morphologic appearance of cells from preinvasive cancer appears only in smears and is not found in sections. The striking specificity of these exfoliated cells is as yet a matter of speculation. Since they have been seen also in cases of covert invasive cancer, it may be suggested that the specific cell structure is due to a better state of cellular preservation. These cells should be distinguished from the "precancer cell-complex" described by Ayre [10] as indicative of the development of cancer before abnormal cell growth has actually started. No evidence of such cells was found in the material investigated. The exfoliated preinvasive cancer cells are those shed from a definite area of cancer, which, however, is limited to a nonulcerated surface.

TABLE 3.—*Positive Cytologic Smears of Classes 4 and 5*

Cytologic Diagnosis	Pathologic Diagnosis and Follow-Up							
	Overt Invasive	Covert Invasive	Preinvasive	Borderline	Endometrial	Total Positive	Total Negative	Not Investigated
Preinvasive, 84	1	2	49	3	1	56	5	23
Invasive....118	77	1	6	1	1	86	15	17
	—	—	—	—	—	—	—	—
Total.....202	78	3	55	4	2	142	20	40
Asymptomatic	11	1	45	4	1	..	..	..

TABLE 4.—*Carcinogenesis in Relation to Age*

	Average Age	Youngest	Oldest	P & A*
Borderline cases.....	31	19	47	0
Preinvasive cases.....	40	19	72	35
Covert invasive cancer.....	46	27	68	42
Overt invasive cancer.....	50	24	89	49

* Pund and Auerbach.

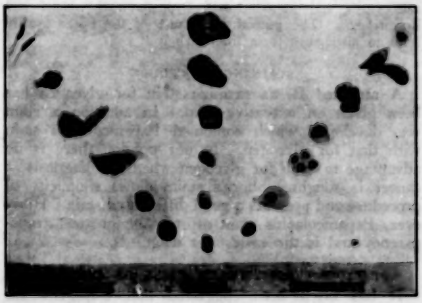
In a total of 97 cases the diagnosis was positive for preinvasive cancer by the endocervical smear (1 per cent). Of these, 71 were investigated, revealing 14 incorrect diagnoses consisting of 4 cases of invasive cancer, 1 endometrial cancer, 3 borderline cases and 6 cases with negative biopsies. The smears from which preinvasive cancer was diagnosed showed only 6 false positive results for cancer, or 8 per cent in relation to the number of 71 cases investigated.

10. (a) Ayre, J. E.: Diagnosis of Preclinical Cancer of the Cervix. Cervical Cone Knife: Its Use in Patients with a Positive Vaginal Smear, J. A. M. A. 138:11 (Sept. 4) 1948. (b) Ayre, J. E.: Cervical Cytology in Diagnosis of Early Cancer, ibid. 136:513 (Feb. 21) 1948.

DETECTION OF INVASIVE CERVICAL CANCER

The criteria for the diagnosis of cancer have been repeatedly described in detail and are beyond the scope of this report. Briefly the following features are characteristic for malignant cells: diffuse cellular forms of varied size and shape, elongated cells resembling muscle fiber cells with an elongated hyperchromatic nucleus or two or three nuclei, increased nuclear activity evident by clumping of the chromatin, granularity and sometimes an increased amount of nuclear substance. Mitotic figures may be found, but they are rare. Only single or multinucleated giant cells are found. There may or may not vary greatly in nuclear size. The ratio of the nucleus to the cytoplasm may be increased; however, abundant cytoplasm is frequently found. The diagnostic criteria for endometrial cancer are similar to those for cervical cancer. Usually, however, there is less variation in size and shape of the nucleus and less difference in size from the normal nucleus as compared with nuclear changes in cervical cancer.

A diagnosis of invasive cancer was made in 235 cases (2.4 per cent), 117 in class 3 and 118 in classes 4 and 5.



Photomicrograph showing the criteria for the differential recognition of invasive, normal and preinvasive cells in the diagnosis of cancer.

In class 3, 62 patients were investigated by histologic sections and there were 28 false positive results (46 per cent).

In classes 4 and 5, 103 patients were investigated and there were 15 false positive results (15 per cent).

SOURCES OF ERROR IN CYTOLOGIC DIAGNOSIS

On the whole, nuclear and cellular size, shape and structure of exfoliated cells is so diverse that definite criteria for their diagnosis cannot be described. In the author's opinion the recognition of cancer cells can be achieved only by long practice and with a thorough understanding of normal cellular changes of the vagina, cervix, endocervix and endometrium. In addition, the recognition of the great variety of atypical cells occurring in conditions other than cancer (such as chronic inflammation of the cervix, polyps, regenerating epithelium and possibly squamous metaplasia) should be regarded as the basic knowledge for the diagnosis of malignant cells. During pregnancy certain cellular changes may occur which should be well studied in order to distinguish these cells from cells shed from preinvasive cancer and presenting a similar morphologic appearance. The main sources of error are presented by histiocytes, hyperplastic endocervical

and endometrial cells and possibly basal cells. In addition a number of unidentifiable cells are frequently found, which are in no relation to cancer.

Histiocytes.—Histiocytes may appear in any size and shape, and their differentiation from malignant cells at times presents great difficulty. The main characteristics, not necessarily always present, are perhaps the fine granularity and transparency of the nuclei with distinct borders and the faint outline of the cytoplasm. Histiocytes usually appear loosely in groups rather than in compact clusters. They may form giant cells with numerous nuclei, which are usually small, more or less uniform in size and agranular.

Endocervical Cells.—Endocervical cells are comparatively easily recognized. They are small cells with little cytoplasm and show only a small degree of variation in cellular and nuclear size. Occasionally the columnar shape is maintained. Hyperplastic endocervical cells may be more difficult to recognize and to distinguish from low grade adenocarcinoma.

Endometrial Cells.—The morphologic appearance of endometrial cells depends on the functional activity of the endometrium. They are smaller than endocervical cells and have less cytoplasm. Hyperplastic endometrial cells may sometimes be mistaken for a low grade adenocarcinoma.

Basal Cells.—During or after menopause frequently basal cells are found which show hypertrophy of nuclei and cytoplasm, anisocytosis and anisonucleosis, hyperchromatic nuclei and karyorrhexis. The general appearance of the smear usually helps to distinguish these from malignant cells.

STAINING PROCEDURE

A modified Best's carmine stain for glycogen has been given an extensive trial. In addition a stain was developed which combined Papanicolaou's stain with that for glycogen. In our opinion there is no advantage to stain for glycogen when the diagnosis of cancer is sought. Shorr's stain allows simplicity of procedure and presents a good differential stain. However, Papanicolaou's stain affords the greatest transparency and is the easiest for diagnosis.

ESTROGEN ACTIVITY IN CASES OF CANCER

It has often been suggested that estrogens are carcinogenic and that the estrogenic level was elevated in patients with cancer. The first series of 1,500 women comprising all age groups was studied for the estrogenic level.[11] The criterion for estrogen activity was complete cornification of the vaginal smear. During childbearing age this occurs normally in the follicular phase. However, estrogenic smears were found in women without cancer during and after menopause, their incidence decreasing with advancing age. The occurrence of cornified vaginal smears in patients with cancer was approximately though slightly higher up to the age of 60. In the groups past 60 a more notable increase in cornified smears occurred in patients with cancer (44 per cent) than in those who apparently were free of cancer (27 per cent) (table 5). Whether this slight difference has any significance in relation to cancer must await further investigation.

COMMENT

The use of the endocervical smear method for the screening of 10,000 unselected patients has shown its value for the detection of early cancer especially in unsuspected asymptomatic cases. Furthermore, the real significance and value of the method has been most clearly established. From the evidence reported, it is apparent that this method should not be recommended as a diagnostic procedure. Its interpretation is difficult and unreliable for anyone who has not been trained for at least one year with a sufficient amount of material. Selective application of the test will result in failure to detect a larger number of cases of early cancer in unsuspected women. Furthermore, in view of the smaller number of cases detected, the cost of diagnosis would be prohibitive if applied in this manner.

The foregoing data showed that of all patients investigated 45 per cent were confirmed to have invasive squamous cell carcinoma of the cervix, while 29 per cent had preinvasive cancer. On this basis 44 cases of invasive cancer, which represent 45 per cent of the remaining 98 cases for investigation, are added to the 106 confirmed cases. The incidence of invasive cancer of the cervix therefore appears to be 1.5 per cent, but the addition of 28 cases of preinvasive cancer (29 per cent of 98) to the confirmed cases suggests that the incidence of preinvasive cancer is 1 per cent.

The negative biopsies in presence of positive smears have only temporarily been classified as "false positive." In a number of these cases inadequate biopsy specimens were taken and further observation and investigation of these patients may disclose an additional number of cancers and thus reduce the incidence of false positive results. This is in line with a number of patients who had previously negative biopsies and are now, after repeated biopsies, reported in the group with positive results.

TABLE 5.—*Increased Cornification of Vaginal Epithelium in Postmenopausal Women with Cervical Cancer and in Apparently Normal Women*

Age	Normal, Per Cent	With Cancer, Per Cent
41 to 50	51	54
51 to 60	28	30
61 and over	27	44
Average	35	42

The cost of detecting a single case of preinvasive cancer is estimated at $120 to $150. This does not include the cost of detecting the cases of invasive cancer. Inclusion of the latter would result in a further decrease of expense per case detected.

Recognition of a distinctive morphologic appearance of the exfoliative cell in preinvasive cancer is important, for it is in this type of cancer that biopsies are frequently apt to be negative. The thorough knowledge of cells shed from preinvasive cancer prevents the classification of results in such cases as negative and necessitates removal of further tissue for biopsy until the cancerous area is located. The detection of cancer does not rest with the cytologist alone, for the number of biopsy specimens taken by the physician will determine the number of diagonses made, as recently brought out by Foote and Stewart.[12] The procedure of scraping the endocervical canal in addition to securing biopsy specimens has revealed that scrapings may be positive in the

11. Nieburgs, H. E.; Pund, E. R., and Nettles, J. B.: Carcinoma of the Cervix and Uterus; Its Relation to Endogenous Estrogens and Diagnostic Techniques, Acta De L'Union Internationale Contre le Cancer, 1949.

12. Foote, F. W., Jr., and Stewart, F. W.: The Anatomical Distribution of Intraepithelial Epidermoid Carcinoma of the Cervix, Cancer 1: 431, 1948.

presence of negative biopsies.[13] It may also reveal the presence and extent of invasion. Furthermore, the preparation of serial blocks from the whole specimen greatly increases the likelihood of one's finding the cancerous area.[9] Thus, one negative biopsy in conjunction with a positive cytologic diagnosis is not sufficient evidence to rule out cancer. Conversely, only one negative smear should not be regarded as proof of the absence of cancer.

SUMMARY

An attempt has been made to evaluate the technic of exfoliative cytologic diagnosis in the detection of cancer of the cervix uteri, especially of early cancer, by the routine study of smears from the cervices of 10,000 women. According to the method of Papanicolaou smears in classes 1 and 2 were considered negative and in classes 4 and 5 were considered positive. The equivocal class 3 was also considered positive in our series, because we were especially interested in detecting early cancers. Twenty-one per cent of all preinvasive cancers and 25 per cent of all invasive cancers were found in this group.

The value of the test as a screening process is evident from our results. It is stressed, however, that study of exfoliative cells should not be regarded as a complete diagnostic procedure, and the difficulties of interpretation and the importance of proper training of cytologists are emphasized.

Positive smears were obtained in 3.3 per cent of the 10,000 women. Histologic study of surgical specimens from a large number of this group revealed that 76 per cent had cancer and 3 per cent had borderline changes. Results in 21 per cent of the smears are at present considered as false positive. It should be noted that the percentage of false positive results is in terms of the number of cases ipvestigated by histologic study and not in terms of the series as a whole.

Cancer was discovered in 2.5 per cent of the entire series, and 40 per cent of the detected cancers were preinvasive. Forty-two per cent of patients with proved cancer were asymptomatic for cancer.

A comparison has been made between the so-called equivocal class 3 and the positive classes 4 and 5. In the group with class 3 smears cancer was found in 56 per cent, borderline changes in 4 per cent and false positive results in 40 per cent. In the group with class 4 and 5 smears, cancer was found in 85 per cent, borderline changes in 3 per cent and false positive results in only 12 per cent.

Attention is again called to the morphologic appearance of cells exfoliated from preinvasive cancers. The recognition of this type of cell enables the cytologist to detect a greater number of preinvasive carcinomas. Eighty-four per cent of histologically confirmed preinvasive cancers were detected as such by study of exfoliated cells.

The average age of patients increases in sequence with the stages of pathogenesis of cancer, borderline changes to preinvasive to covert invasive to invasive cancer.

The cost of detecting a single case of preinvasive cancer is estimated at $120 to $150.

13. Pund, E. R.; Nettles, J. B.; Caldwell, J. D., and Nieburgs, H. E.: Preinvasive and Invasive Carcinoma of Cervix Uteri: Pathogenesis, Detection, Differential Diagnosis and the Pathologic Basis for Management, Am. J. Obst. & Gynec. 55:831, 1948.

ABSTRACT OF DISCUSSION

DR. WILLIS E. BROWN, Little Rock, Ark.: At the annual session in Chicago in 1948 an exhibit reported experience at the University of Iowa with the routine cytologic examination of 5,000 women as a population screening. The essayists are reporting an additional 10,000 women studied in a similar manner. A cytologic laboratory was established at the University of Iowa and received slides from all women over 35 years of age entering the University Hospital on the gynecologic service. Here careful pelvic examinations and frequent biopsy permitted a close check of this procedure. Patients whose slides showed abnormal cells were subjected to critical examination to determine the nature of the surface from which these cells were shed. In our series the evidence of unsuspected cancer of the uterus was 1:200 and of undetectable cancer 1:500. The assayists report a somewhat higher incidence of cancer. This undoubtedly is largely accounted for by the source of material—for their slides were obtained from patients, many of whom had vaginal bleeding, who consulted a physician for pelvic symptoms. A second source of the increased incidence may lie in the material included in the category of borderline and preinvasive cancer. Pathologists differ in their interpretations of the histologic sections containing "intraepithelial metaplastic or anaplastic" cells. A third factor in their higher incidence is the method of obtaining smears. The use of the physician's examining table, speculum and good light here reported is ideal, but limits the number of patients seen to those that the physician's office can accommodate. The procedure reported by us permits a nurse or trained woman worker to collect approximately 100 smears daily. Unfortunately popular demand has forced this procedure into the unenviable position of competing with the biopsy as a method for the diagnosis of cancer. We do not believe that the cytologic examination is diagnostic of cancer but firmly believe that it is of great value as a case-finding technic. Patients who shed abnormal cells are called to the attention of the clinicians, whose responsibility it is to determine the surface from which the abnormal cells were derived. In our laboratory placing a screened marked slide on the microscope of the pathologist for interpretation costs $1 to $1.25. There are certain dangers involved in this procedure, dangers inherent in the uncritical reliance by the clinician on laboratory reports. The terms cancer test, cytology test, positive slide and negative slide immediately convey a finality which is both unimplied and dangerous. I should like to caution against use of the terms cancer cells and cancer tests and to suggest that the cytologist be content with normal and abnormal or suspicious and permit the clinician or histologist to determine the nature of the surface from which these exfoliated cells have been obtained.

DR. EMIL NOVAK, Baltimore: There appears to be general agreement that vaginal cytologic studies, in the hands of the comparatively small group properly trained to interpret them, constitute a valuable screening method which, as the essayists have pointed out, has definite limitations. The most important point to emphasize, in order to avoid bringing the method into disrepute, is that its results are not decisively diagnostic and should never in themselves be made the basis for radical treatment, either surgical or radiologic. The chief field for cytologic study is in the detection of preclinical lesions, whether of intraepithelial or early invasive type. Although genuinely intraepithelial lesions are not malignant, most physicians believe that an indeterminate proportion of them will at some unpredictable time develop into invasive cancer. However, there is much confusion and difference of opinion as to the chronologic and sequential relation of noninvasive and invasive lesions, and similar differences of opinion among pathologists as to the criteria of invasion. Vaginal smear studies have thus far only accentuated this confusion, and it is already clear that such studies cannot enable one to distinguish between intraepithelial and invasive cancer. My own feeling is that its possibilities should be fully explored, but only in those clinics and laboratories fully equipped for the purpose. This at once excludes a large proportion of gynecologists as well as general practitioners from utilization of the method, in spite of the desultory efforts to minimize this handicap by smear-

mailing methods. The point I would like especially to emphasize is that the gynecologist need not consider himself hamstrung or even greatly handicapped if, voluntarily or involuntarily, he does not make use of vaginal cell study. In the presence of a suspicious target lesion I would consider myself far more derelict in omitting biopsy than in omitting a vaginal smear. It is only in the screening of ostensibly normal women that vaginal smears have an advantage over biopsy, but these constitute only a small proportion, probably less than 1 per cent, of all those with cervical cancers. Even in this group multiple biopsy or, even better, surface biopsy by one technic or another (not cervical smears) will usually reveal preclinical lesions. I believe that, in the patient who conscientiously reports for periodic examination, the gynecologist who practices painstaking inspection and palpation of the cervix with full use of the tried method of biopsy when there is the slightest clinical suspicion of cancer will not miss many cancers in a still early and therapeutically favorable stage.

DR. MARTIN W. DIETHELM, Toledo, Ohio: In the Academy of Medicine during my presidency in 1947 we embarked on a campaign to make a gynecologic survey in the city of Toledo. We kept this in the Academy itself, and the Council fought it for a year before they permitted the procedure to begin. Each physician may purchase a kit containing slides, a bottle with the alcohol and ether and bulb and pipet. A request card in triplicate states the patient's name, age, previous history, present complaints, gynecologic examination and date smear was taken. When the physician sees his patient in the office, he takes the smear, performs the gynecologic examination, records his observations on the request card; he then takes the smears to the hospital, along with his request in triplicate. One request goes to the pathologist of his choice, one to the central registry of the Academy of Medicine, and one returns to the physician. He and his consultants are entirely responsible for therapy. We began by having a meeting of the pathologists to find out whether they were equipped and willing to cooperate in this procedure. We had almost 100 per cent cooperation. Then the pathologists, particularly Dr. Edward Burns, demonstrated the procedure and gave the physicians a comprehensive outline of the subject. We have a perpetual file wherein the woman's name advances day by day, and when her name comes up again—once in six months—two cards in an envelope go to the physician's office. He sends one, the appointment card, to the patient, who returns to his office. The procedure is again the same. The reports are not stated in such a way as to give conclusive evidence. The cell structure is described, and the final line states, "No neoplastic cells found" or "Neoplastic cells found; suggest biopsy." We believe that biopsy must be done to confirm the diagnosis. We do not rely on the Papanicolaou technic alone. Dr. Burns last May reported in Columbus, Ohio, that he had surveyed some four or five thousand cases. We began this survey in 1947, very slowly, and continued it in 1948 and in 1949. Here is a system for use in my city by all physicians and all pathologists, in connection with a central registry in the Academy of Medicine. This is perfectly controlled. One of the two cards that go out to the physician has on it the data in relation to follow-up (for instance, "Changed doctors; unable to locate"), as well as the final termination of the case, such as operation or radium or roentgen therapy. No patient is ever lost track of. This second card is filed with the registry, whose job it is to follow every case to its conclusion.

DR. H. E. NIEBURGS, Augusta, Ga.: The discrepancy in the incidence of preinvasive cancer pointed out by Dr. Brown is probably due to the different methods used. We took in each case endocervical and vaginal smears and found in many cases that a smear taken from the posterior fornix would be negative while the endocervical smear was positive. Also, the greater selectivity in our series of patients in comparison with those of Dr. Brown apparently plays a part in the higher incidence. In reference to Dr. Novak's discussion it appears that tissue cultures of preinvasive cervical cancer behave in the identical manner as invasive cancer of the cervix, as demonstrated by Dr. Glatthaar of Zurich, Switzerland. Furthermore, lesions are reported in the literature which, when untreated or inadequately treated, developed into invasive cancer.

NEW DIAGNOSTIC ADJUNCT FOR UTERINE CANCER

LESTER D. ODELL, M.D.
and
JAMES C. BURT, M.D.
Chicago

Physicians are besieged today by an aroused public seeking assurance that they are free of cancer. This fear, though largely instigated by the press, is not without factual basis. It has been estimated that over 21,000 women in the United States die annually of genital cancers,[1] of which 17,000 are uterine in origin.[2] Of all cervical cancers, it is reported,[3] only 20 per cent reach the gynecologist in an early stage when the chances for cure are best. It is therefore with reason that attention has been directed toward methods for the early detection of genital cancer.

For the past several years the Papanicolaou smear has been used in some clinics as a screen for uterine cancer. Unfortunately, false negative results occur, in 30 per cent of the cases according to a prominent gynecologist.[4] Furthermore, it is acknowledged that specialized training in cytology is a prerequisite for reliable results. And, even if the Papanicolaou method were satisfactory, there are not enough trained cytologists, and little prospect of training them for years. Every physician would welcome a simple chemical test which could be used with confidence.

As to enzymes, "each normal tissue is characterized by the presence of an individual pattern of enzymatic activity which may serve to distinguish it from all other tissues—tumors have qualitatively the same enzymes as normal tissues" (Greenstein [5]). Cancer tissues, however, may exhibit quantitative differences in enzymic pattern from their benign counterparts. These differences may vary from tissue to tissue. The problem in obtaining a diagnostic adjunct has been one of finding the enzyme (or enzymes) which is most quantitatively altered and a reaction which is simple enough for average technical facilities.

In 1937 Marrian [6] described a reaction whereby estriol glucuronide was hydrolyzed during its passage through mouse intestine. This action was ascribed to glucuronidase. Through a series of experiments the activity of beta-glucuronidase has been closely related to glucuronic acid metabolism,[7] estrogen metabolism,[8] growth of the endometrium,[9] normal pregnancy [10]

Drs. William J. Dieckmann and Herbert E. Schmitz assisted in this study.

From the Department of Obstetrics and Gynecology, the University of Chicago and the Lying-In Hospital.

Supported in part by the Cancer Research Fund of the Chicago Lying-In Hospital.

Read in a Symposium on Carcinoma of the Cervix before the Section on Obstetrics and Gynecology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1949.

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2. Novak, E.: Cancer of the Uterus, J. A. M. A. 135:199 (Sept. 27) 1947.

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4. Scheffy, L. C.; Rakoff, A. E., and Hoffman, J.: An Evaluation of the Vaginal Smear Method for the Diagnosis of Uterine Cancer, Am. J. Obst. & Gynec. 55:453 (March) 1948.

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9. Odell, L. D., and Fishman, W. H.: Studies on β-Glucuronidase: I. Activity in Human Endometrium, to be published.

10. McDonald, D. F., and Odell, L. D.: Serum β-Glucuronidase Activity During Normal and Toxemic Pregnancy, J. Clin. Endocrinol. 7:535, 1947.

and toxemia of pregnancy.[11] With respect to cancer Fishman and Anylan [12] have noted greater glucuronidase activity in mammary carcinomas and involved lymph nodes, and in gastric, intestinal and metastatic carcinomas, than in normal uninvolved tissues. Moreover, an inhibitor substance was detected in cancer tissue in low concentration.[13]

The method of determining glucuronidase activity is colorimetric. The test substance, or substrate, is phenolphthalein glucuronide, which is extracted from the urine of rabbits to which phenolphthalein diphosphate was administered. This substance (substrate) is incubated with the source of the enzyme, the tissue or fluid to be tested, a process which liberates the phenolphthalein radical. If this solution is adjusted to an alkaline hydrogen ion concentration a red color results. The intensity of this color is compared with known amounts of phenolphthalein, and the activity of beta-glucuronidase is expressed as the micrograms of phenolphthalein liberated per gram or cubic centimeter of tissue or fluid per hour of incubation.

METHOD

Assays on Vaginal Fluid.—With an immunologic pipet, a 0.1 cc. portion of vaginal fluid was suspended in 3 cc. of distilled water. If less than 0.1 cc. of vaginal fluid was available a 0.2 cc. pipet was employed and fractions of 0.1 cc. (as little as 0.02 cc.) were measured and suspended in thirty times as much water. To three clean Wassermann tubes were added 0.8 cc. of acetate buffer (p_H 4.8), 0.1 cc. of vaginal fluid in water suspension and 0.1 cc. of phenolphthalein glucuronide solution.[14] These were corked, shaken and incubated at the optimum temperature of 38 C. At the end of three hours one tube was removed, inactivated with 1 cc. 5 per cent trichloroacetic acid, shaken, centrifuged for a few minutes and the supernatant fluid decanted into a test tube containing 2.5 cc. glycine buffer and 1.5 cc. distilled water so adjusted with 0.5 per cent solution of sodium hydroxide that the combination of solutions reached a p_H of 10.2 to 10.4. If a red color developed, the other tubes were removed, inactivated with trichloroacetic acid, centrifuged, added to glycine and read in a colorimeter. If only a pink color or no color developed, the incubation was allowed to continue overnight before inactivation. Phenolphthalein standards were prepared with test tubes made up to 6 cc. with the same reagents as used in the foregoing procedure but containing 2, 5, 10, 20 and 30 micrograms of phenolphthalein. Colorimetric readings were made on a Coleman junior model 211. Details of this method have been reported elsewhere by Fishman, Springer and Brunetti.[15]

Assays on Tissues.—Fresh tissues were weighed, thoroughly homogenized with distilled water, centrifuged and the supernatant fluids assayed as in the foregoing section for glucuronidase activity. Histologic preparations were made from tissues adjoining those assayed. Specimens of actively growing, nonnecrotic tumor tissue were selected.

RESULTS

The use of beta-glucuronidase activity as a diagnostic aid for female genital cancer was commenced on July 1, 1948.[16] The data are arranged in two parts. The first concerns the activity of this enzyme in vaginal fluid from women with and without cancer, while the second lists the activity in histologically benign and malignant tissues of the human female genitalia.

Observation for vaginal fluid are listed in the accompanying table. In clinically benign conditions there was a wide distribution of values. With 30 units used as a practical line of demarcation between a positive and negative test, the percentage of false positive results was 18. False positive results occurred predominantly during pregnancy, during menstruation and in women with vaginitis. Untreated cervical and corpus cancer was associated with a high activity of enzyme in the vaginal fluid. Care must be employed to avoid contamination of the vaginal fluid with lubricating jelly, preservatives and fresh blood. Likewise, douches previous to examination are discouraged. Fresh blood inhibits the activity of this enzyme in vaginal fluid. However, this inhibition is not always present when the bleeding originates from the corpus, possibly because the vaginal discharge contains shedded endometrium which is high in glucuronidase activity. Of the two methods, tissue and vaginal fluid assay, the latter (vaginal fluid) is easier and more practical for large surveys. The vaginal fluid method appears to be applicable for the detection of untreated uterine cancers.

Beta-Glucuronidase Activity in Vaginal Fluid; a Frequency Table

Activity of Beta-Glucuronidase, Micrograms*	Benign	Cancer †	
		Cervix	Corpus
0 to 30	169	..	1
31 to 100	74	..	1
101 to 200	48	..	..
201 to 300	10	..	..
301 to 400	9	4	1
401 to 500	14	4	1
501 to 1,000	23	14	3
Over 1,001	6	9	2
Total	292	31	9

* Micrograms of phenolphthalein liberated per cubic centimeter of fluid per hour of incubation.
The dotted line indicates a practical division between a positive and negative result.
† Untreated (preirradiated) cancers.

Observations for tissue are portrayed graphically in the accompanying figure. Except for the pregnant cervix,[16b] a consistent difference in glucuronidase activity was observed between cases of histologically proved squamous cell cervical carcinoma (which were high) and histologically nonmalignant cervices (which were low). Glucuronidase values for endometrial carcinoma, however, were within the range for nonmalignant endometrium. It is of interest that the activity in nonmalignant and malignant endometrial tissue is much greater than in any other genital tissue and constitutes one of the highest obtained in the body.

The nonmalignant cervix disclosed a variety of histologic changes. Among these, in addition to the histologically normal cervix, were acute and chronic cervicitis with nabothian cysts, cervical erosion and leukoplakia. It is significant that a majority of the benign cervices studied were obtained from patients on whom a cervical biopsy was performed because of a suspicion of malignancy. No correlation could be

11. Odell, L. D., and McDonald, D. F.: Serum β-Glucuronidase Levels During Toxemia of Pregnancy, Am. J. Obst. & Gynec. **56**:174 (July) 1948.

12. Fishman, W. H., and Anylan, A. J.: Comparison of the β-Glucuronidase Activity of Normal, Tumor and Lmph Node Tissues of Surgical Patients, Science **108**:66, 1947.

13. Fishman, W. H.: Anti-Glucuronidase: Variations in Blood and Tissue, Abstracts of the Chicago Meeting American Chemical Society, April 1948, p. 3C.

14. A fourth tube contained 0.1 cc. vaginal fluid suspension and 0.8 cc. acetate buffer. It was used as a control, and 0.1 cc. phenolphthalein glucuronide was added just prior to reading on the colorimeter. The vaginal fluid suspensions were centrifuged and the supernatant fluids also assayed. This second step is of no practical value for diagnostic purposes.

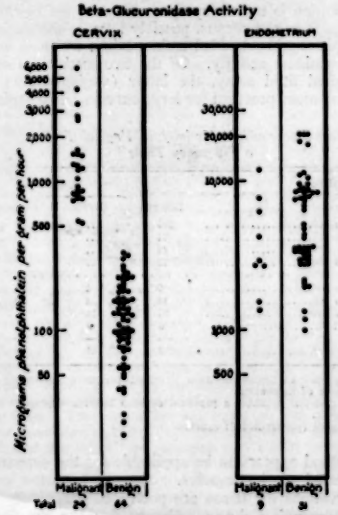
15. Fishman, W. H.; Springer, E., and Brunetti, R.: Application of an Improved Glucuronidase Assay Method to the Study of Human Blood β-Glucuronidase, J. Biol. Chem. **173**:449, 1948.

16.(a) Odell, L. D., and Burt, J. C.: β-Glucuronidase Activity, Science **108**:364, 1949; (b) β-Glucuronidase Activity in Human Female Genital Cancer, Cancer Research **9**:362, 1949.

made between the type of benign pathologic condition and the activity of beta-glucuronidase in the tissue. This is illustrated by the following case:

A woman aged 62, sextipara multigravida, was admitted to the hospital because of a friable, bleeding cervix suggestive of a malignant growth. Three full thickness specimens of the cervix, including the portio vaginalis and endocervix, were obtained. The histologic diagnosis was polypoid hypertrophy of the endocervix, severe infection, no malignant growth. The levels of glucuronidase activity of the cervical tissues were 85, 275 and 185 micrograms. It is of interest that some of the tissues obtained from relatively normal cervices assayed higher in glucuronidase activity than did tissue in this case.

Five patients were observed on whom a diagnosis of an early cervical cancer had been made by outside pathologists. However, these cases were reviewed by three prominent Chicago pathologists,[17] who decided



Units of beta-glucuronidase activity are portrayed graphically on a semi-log scale. Tissues assayed were obtained from patients with untreated (preirradiated) carcinoma. Note that the scale for endometrium is 10 times that for cervix.

against a diagnosis of malignancy. Assays for tissue glucuronidase activity were within the range of benign cervical lesions in all 5 patients.

REPORT OF CASES

Case 1.—R. C., a woman aged 45, nullipara, tertigravida, was referred to Mercy Hospital by an outside pathologist with a diagnosis of early cervical cancer. Speculum examination did not disclose a cervical lesion. A cervical biopsy specimen was obtained. Histologic examination of this specimen and of the slide prepared elsewhere by Dr. Herbert E. Schmitz did not disclose malignant growth. Treatment for cervical carcinoma was not advised. The glucuronidase activity of the cervical tissue was 97 units.

Case 2.—V. T., a woman aged 30, nullipara, primigravida and 3½ months pregnant, was referred to Mercy Hospital by two outside pathologists with a diagnosis of cervical cancer. Speculum examination disclosed a well defined erosion of the cervix. A cervical biopsy specimen was obtained. Histologic examination of this specimen and of the slides prepared elsewhere by Dr. Herbert E. Schmitz disclosed changes due to pregnancy but no malignant changes. Treatment for cervical carcinoma was not instituted. The glucuronidase activity of the cervical tissue was 294 micrograms.

Case 3.—R. R., a woman aged 39, unipara, primigravida, was referred to Mercy Hospital from Manila, Philippine Islands, by two outside pathologists with a diagnosis of early cervical cancer. Speculum examination disclosed a cervix of normal appearance. Three biopsy specimens were obtained. Histologic examination by Dr. Herbert E. Schmitz of these specimens and of the slide prepared elsewhere did not disclose malignancy. Treatment for cervical carcinoma was not given. The glucuronidase activity of the cervical tissue was 180 micrograms, of the vaginal fluid 900 micrograms.

Case 4.—J. L., a woman aged 52, unipara, secundigravida, was admitted to Mount Sinai Hospital with a diagnosis of cervical carcinoma made by an outside pathologist. Speculum examination disclosed a granular cervix. A cervical specimen for biopsy was obtained, and radium was inserted. Histologic examination of this specimen and of the slide prepared elsewhere by Dr. I. Davidsohn failed to disclose malignant changes. When this opinion was received the radium was removed; the patient had received 2,200 milligram hours of radiation. Further treatment for cervical cancer was not given. The glucuronidase activity of the cervical tissue was 100 micrograms and of the vaginal fluid 95 micrograms.

Case 5.—M. K., a woman aged 34, nullipara, nulligravida, was admitted to the Chicago Lying-In Hospital with a diagnosis of early cervical carcinoma and with a positive Papanicolaou smear (grade 3). Speculum examination disclosed that the cervix appeared to be slightly eroded. Biopsy of a cervical specimen obtained Dec. 3, 1948 was reported as negative for cancer by our pathologist, but two outside pathologists diagnosed an in situ cervical carcinoma. The glucuronidase activity of this tissue was 22 micrograms. However, on Feb. 17, 1949 a total abdominal hysterectomy and bilateral salpingo-oophorectomy was performed, because of two repeated positive Papanicolaou smears and because of the questionable cervical biopsy. Sections through the extirpated cervix did not disclose malignant growth, according to our pathologist. The glucuronidase activity of two specimens from the cervix was 153 and 180 micrograms, of the vaginal fluid 89 micrograms.

Probably too much emphasis has been placed on the diagnostic value of so-called cancer tests. Too many women are subjected to hysterectomy or irradiation because of a positive Papanicolaou smear or because of a questionable cervical biopsy. Use of the method for estimating glucuronidase activity in genital cancer should be considered as a diagnostic adjunct to the morphologic examination of the involved tissue. Since biopsy of every cervix is expensive, an easy screening test is desirable. Assays on the vaginal fluid can be read qualitatively in three hours, a red color indicating values over 300 micrograms for glucuronidase activity. When less than 0.1 cc. of vaginal fluid is available, necessitating the measurement of fractions of this figure, if the result is positive the test should be repeated at a later date for accuracy. If increased activity (over 300 micrograms) is found in the vaginal fluid, or if the vaginal fluid is contaminated with blood, any suspicious areas should be biopsied and assayed for tissue activity. Thus both tests, used in succession, would eliminate many unnecessary histologic preparations of the cervix. Obviously any woman over the age of 40 who has abnormal bleeding should receive a diagnostic curettage.

SUMMARY

Data are presented on the activity of the enzyme beta-glucuronidase in benign and malignant tissues of the human female uterus and in the vaginal fluid obtained from patients with and without uterine carci-

17. Drs. Herbert E. Schmitz, I. Davidsohn and E. L. Potter.

noma. In a limited but carefully controlled series of cases estimation of the activity of this enzyme was successfully used as an adjunct for diagnosis of uterine carcinoma.

ADDENDUM

In additional studies on this problem we have continued to find an increased activity of beta-glucuronidase in the vaginal secretions and tissues of women with untreated cervical carcinoma. To permit evaluation of the method, two independent studies were set up at the clinic. Of 167 assays one group reported 36 positive results (21 per cent), and of 206 assays the other group reported 43 positive results (22 per cent). Collectively, of 665 assays there were 137 positive results in women without clinical evidence of genital cancer, a 20 per cent incidence of false positive reactions. It should be mentioned that patients were studied in whom the vaginal secretions were unusually high in activity (over 2,000 units) but who showed no evidence of malignant growth. Two of these patients did not have a cervix or uterus. All the false positive (and true negative) reactions were evaluated by the Papanicolaou technic and by a diagnostic dilatation and currettage (with biopsy if indicated), but no histologically proved cancer was found. Concurrently, the vaginal secretions from 9 untreated cervical carcinomas were assayed, and all of these were above 300 units in activity.

Investigation of the liberation of beta-glucuronidase by bacteria has continued. Organisms isolated from the vagina were found to liberate enzyme if menthol glucuronide was added to the culture mediums. This suggests that the activity present in vaginal secretions may be partly due to bacterial action, and it may explain the false positive reactions. The details of this study are being presented elsewhere.

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ABSTRACT OF DISCUSSION

DR. J. THORNTON WALLACE, Brooklyn: The enzyme on the presence of which the test is based is one of a group in which considerable interest has been manifested in the relatively recent past. I have been unable to learn whether the increased amount of glucuronidase found in malignant tissue is due to increased production or to decreased utilization of the enzyme. This test possesses the advantage of being based on relatively simple chemical reactions that may be read on a colorimetric scale after a comparatively short period of training, in contrast to the great amount of basic knowledge and long experience necessary for reliable interpretation of vaginal smears. It likewise removes to a large extent the element of personal opinion, in which differences so often arise to becloud the issue in questionable cases. Though the percentage of error has been rather high in this group of cases, errors have all occurred on the positive, or safe, side, in contrast to their occurrence on the negative as well as the positive side in vaginal smears. The percentage of error is probably no higher than that found in any but the most expert hands with vaginal smears. It is difficult to see how chemical analysis of tissue will be much, if any, simpler than histologic examination of biopsy material, which after all provides the final word in the diagnosis of cancer; even though the test is possibly somewhat less expensive, the difference in cost would hardly seem worth while. Unless it is found that in cervical cancer the uninvolved as well as the malignant cervical tissue contains this excess of glucuronidase, if sufficient tissue is to be taken to serve as biopsy material with even its slight danger of dissemination of malignant cells, it may be wiser to proceed directly with histologic examination rather than to run the risk of having to take further biopsy specimens for confirmation of a positive glucuronidase test. The greatest service of this test will lie in the examination of vaginal fluid, serving as an index to the presence of malignant tissue which may be anywhere in the cervix and which might be missed in tissue for biopsy secured from areas not actually containing malignant cells in early lesions. From the evidence presented, it would seem that this test is of value only in cervical carcinoma. It will be of considerable importance to see what, if any, influence benign neoplastic tumors such as polyps and fibromyomas have on the glucuronidase level in both tissue and vaginal fluid. It will be of equal importance to determine whether or not the elevation of glucuronidase levels seen with vaginitis persist after this condition is cleared up.

DR. M. EDWARD DAVIS, Chicago: The enzymatic pattern of normal and abnormal cells may well contain a clue to the origin of neoplastic tissue. Undoubtedly this enzyme is related to estrogenic metabolism, and probably had to do with the conjugation of glucuronic acid. This fits well with what is known about the physiology of reproductive organs. The estrogens are primarily growth-promoting substances, and it is highly probable that this enzyme may be indicative of some change in estrogen metabolism. If further work should substantiate this, it may provide a clue to the origin of carcinoma of the uterus. There are too few data available today concerning the efficacy of the glucuronidase titer as an accurate test for cancer of the uterus. Nevertheless, the fact that there are no negative reactions is important. Physicians are interested in tissue concentration of glucuronidase because they may thereby learn something about the development and progress of cancer. Early cancers may show some change in this enzymatic pattern. There is considerable discussion at present about uterine intraepithelial cancer. Some believe that this diagnosis is being made too often. Obviously, some of these early carcinomas have been missed in the past. It is possible that physiologic changes may play a role in disclosing the transition between intraepithelial lesions and invasive cancer. The enzyme titer may provide information concerning the results of treatment of cancer of the cervix. After irradiation the titer drops and at the end of about six weeks in most instances it returns to almost a normal level. Obviously, therefore, in recurrences there should be some early evidence of a rise in the titer. Drs. Odell and Burt are anxious to have this study extended to some of the large clinics of the country in order to properly evaluate the usefulness of the glucuronidase test in the diagnosis of cancer in the uterus. They would be delighted to supply some physicians with some of the substrate, which is difficult to make, in order that others may help in accumulating sufficient data.

DR. JAMES C. BURT, Chicago: It may be pertinent to mention some of the physical and environmental factors, such as temperature, drying, irradiation, fresh bleeding and the menstrual cycle, which affect the activity of glucuronidase in the vaginal secretions and in genital tissues. Some of these may be of practical value in the transportation of specimens. In the study of the effect of temperature, homogenates of tissue were exposed to 20 C. and 4 C., being tested on successive days. The specimens kept at 20 C. showed a daily decrease in glucuronidase activity, but the portions kept at 4 C. were relatively stable. When enzyme-containing specimens were frozen, the stability of activity of the enzymes was increased. This stability was particularly true of undiluted specimens of vaginal secretion. The effect of drying on glucuronidase activity in vaginal fluid has not been amply demonstrated, but it would seem that drying may increase the stability of the enzyme activity in the few cases studied. The effect of irradiation with radium and roentgen rays on glucuronidase activity of tissue and vaginal fluid has been studied in several cases of cancer with serial determinations. After irradiation with both radium and roentgen rays, glucuronidase activity has tended to decrease in the absence of recurrence of the malignant growth. One might expect the bacterial flora of the vagina to affect glucuronidase activity in the vaginal fluid, particularly since Beuhler and Doisy have demonstrated a significant production of the enzyme by a strain

of Escherichia coli using constant agitation and adding a menthol glucuronide to the culture medium. Working with Dr. Lawrence Greene, Dr. Odell and I have made over six hundred determinations for glucuronidase activity on stock cultures of bacteria and cultures of bacteria from the lower portion of the genital tract of patients with and without carcinoma of the uterus. Up to thirty-five days of incubation in the usual laboratory mediums brought no demonstrable production of the enzyme beta-glucuronidase. This study is being continued. The addition of fresh venous blood will inhibit the activity of the enzyme. The variation in activity in the vaginal secretions has been studied in the same patients. After the cessation of the menstrual flow, the variations were not great.

DR. HERBERT E. SCHMITZ, Chicago: I have had this test employed in a number of cases from our tumor clinic. I believe that its value is going to be tremendous in helping to make a decision as to therapy in questionably malignant lesions where the diagnosis of preinvasive carcinoma has been made. For example, a patient who was sent from Manila to Chicago with a diagnosis of preinvasive carcinoma brought with her the slide, which we did not consider as sufficient evidence. The patient was subjected to the beta-glucuronidase test, and it was found that the result was below the established level of 300 micrograms. The slide was submitted to Dr. Novak, who agreed that it did not indicate preinvasive carcinoma. It was then submitted to another gynecologic pathologist, who considered it preinvasive carcinoma; the armed force's Institute of Pathology, substantiating the original diagnosis of one of its members, agreed that it was carcinoma. Because the beta-glucuronidase level was below 300 micrograms, we have elected to allow this patient to proceed without radical treatment. I think that the experience in this one instance will be the repeated experience in all clinics, and the value of this test is going to be tremendous.

DR. LESTER D. ODELL, Chicago: The enzyme beta-glucuronidase is probably an important metabolic tool for the human body. The formation of glucuronides involves an important detoxification mechanism for various poisons as well as a conjugating mechanism for some of the steroids. In addition it has been shown that an increased activity of glucuronidase is found in actively growing tissues. With respect to cervical cancer this last fact seems significant. The activity of uninvolved portions of the cervix is within the normal range in women with cervical cancer. It is important, therefore, to obtain histologic controls for all tissues assayed. Dr. Schmitz mentioned the use of vaginal assays after irradiation as a prognostic guide. We would like to be cautious on this point. After we have followed our patients for a few years we will be better able to evaluate this possibility.

Cancer of the Prostate.—Huggins et al. (1939) and Huggins and Clark (1940), of Chicago, after a brilliant experimental study of the physiology of the prostate, established the fact that oestrogens are beneficial in cancer of the prostate. Stillboestrol has now been used for about nine years, and it is generally accepted that cancer of the prostate can be controlled by it. Survivals of five or more years are not uncommon. The points which may with benefit be emphasized here are as follows: (1) Castration produces effects similar to those obtained by stillboestrol. (2) About 10 per cent of patients with cancer of the prostate do not benefit at all from this treatment. Careful study of this small percentage is more important than the mere recording of the spectacular improvement of the majority. (3) Although most cases receive about 15 mg. of stillboestrol daily, enormous doses—up to 1,000 mg. daily—have been given for several weeks in late cases, with an extension of periods of regression. (4) In no case can it be said that the disease is eradicated—it is checked or controlled. (5) The mechanism of the action of stillboestrol is still not determined, although much is known about it. (6) There is no accuracy in dosage—it is still a method of trial and error.—Sir Stanford Cade, Chemotherapy in the Treatment of Malignant Disease, *British Medical Journal*, Nov. 26, 1949.

CARCINOMA OF THE UTERINE CERVIX COMPLICATING PREGNANCY

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According to reports of the last five years, there has been little effort to detect early cancer of the cervix during pregnancy. Such neglect is remarkable both because of availability (Oxorn [1]) to all general practitioners and obstetricians of the diagnostic cervical smear, as described by Papanicolaou and Traut,[2] and because of the status of carcinoma in situ or intraepithelial preinvasive cancer, which particularly concerns pregnancy.

INCIDENCE OF CERVICAL CANCER IN PREGNANCY

The frequency of cervical cancer in pregnancy can be only approximated. Foote and Li,[3] quoting from the Department of Statistics, Memorial Hospital, and the New York State Division of Cancer Control, listed 1 cervical cancer per 1,500 women over 35 years of age in the general female population; de Rezende[4] stated that the incidence of cervical cancer in women of reproductive age is 0.02 per cent and the incidence of pregnancy in cervical cancers is 0.34 per cent.

TABLE 1.—*Age Distribution and Population Incidence in 1,522 of 4,652 Cases of Cervical Cancer*

Age	Percentage	Rate per 10,000 Population*
15 to 19	0.08	0.42
20 to 24	0.69	1.96
25 to 29	2.60	5.00
30 to 34	6.30	8.30
35 to 39	10.10	11.50
40 to 44	13.10	15.90

From statistics of M. G. Sadugor and J. P. Palmer (Am. J. Obst. & Gynec. 56:680-688 [Oct.] 1948), including 3 cases of cervical cancer in the first two decades of life.

* The rate is calculated from the number of patients admitted and the female population in that age group according to the New York state census of 1940.

There are no reports of cervical cancer from large series of systematically studied consecutive pregnancies; in fact, there is only one reference to the use of the smear method, by Kernodle, Cuyler and Thomas.[5] The series of Ward [6] and Willson,[7] and our own series, show the frequency over many years of admissions to large maternity hospitals, mainly of women with late cervical cancer in pregnancy (table 3).

Consideration of the characteristics of carcinoma in situ indicate its relative frequency in pregnancy. Novak [8] states his belief that noninvasive cervical cancer is the beginning of infiltrating cancer and may be of extremely variable duration. Pund and associates [9]

Read in a Symposium on Carcinoma of the Cervix before the Section on Obstetrics and Gynecology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 16, 1949.

1. Oxorn, H.: Surg. Gynec., & Obst. 87:197-205 (Aug.) 1948.
2. Papanicolaou, G. N., and Traut, H. F.: New York, The Commonwealth Fund, 1943.
3. Foote, F. W., and Li, K.: Am. J. Obst. & Gynec. 56:335-339 (Aug.) 1948.
4. de Rezende, J., in a paper read before the Sixth Argentine Congress of Obstetrics and Gynecology, 1946; Gravidez e cancer do colo, Rev. de ginec. e d'obst. 31:583-622 (Aug.) 1947.
5. Kernodle, J. R.; Cuyler, W. K., and Thomas, W. L.: Am. J. Obst. & Gynec. 56:1083-1089 (Dec.) 1948.
6. Ward, G. G.: J. Mt. Sinai Hosp. 14:674-678 (Sept.-Oct.) 1947.
7. Willson, J. R.: Am. J. Obst. & Gynec. 50:273-283 (Sept.) 1945.
8. Novak, E.: Cancer of the Uterus, J. A. M. A. 138:199-206 (Sept. 27) 1947.
9. Pund, E. R.; Dick, F., Jr., and Cardwell, E. S., Jr.: South. M. J. 41:711 (Aug.) 1948. Pund, E. R.; Nieburgs, H. E.; Nettles, J. B., and Caldwell, J. D.: Am. J. Obst. & Gynec. 58:431-437 (May) 1949; Preinvasive Carcinoma of Cervix Uteri, Arch. Path. 44:571-577 (Dec.) 1947.

have stated that 4 per cent of all discovered cervical cancers are in the early preinvasive stage and are seen in a disproportionate number of pregnancies. They believe that the average duration of preinvasive cervical cancer is 6.5 years and that the majority of cervical cancers become obvious eleven years after incipiency (in situ) or five years after invasion. They report 3.9 per cent preinvasive cancers in 1,200 removed cervices, with an average patient age of only 37.7 years.

SYMPTOMS OF EARLY CERVICAL CANCER IN PREGNANCY

Sadugor, Palmer and Reichard [10] studied 124 women with pregnancies complicated by cancer, of whom 62 per cent were between 30 and 40 years of age (the youngest 18), with an average of five pregnancies (only 11.2 per cent were seen during their first pregnancy) and of whom 73 per cent had painless bleeding, 19 per cent had discharge and 8 per cent were without symptoms. Among Foote and Li's [3] 18 patients with nonpregnant cervical carcinomas in situ, 12 had no gynecologic symptoms, 1 only slight discharge and 5 only slight bleeding; clinically, there was no suspicion of cancer in 16, a diagnosis of cancer in 1 and of leukoplakia in 1. Incidentally, all smears of material from the vaginal vault were negative, but 14 cervical smears were positive from the 18 biopsied cervices. Diddle and others [11] reported noninvasive cervical cancers in 17 women, of whom several had no symptoms or signs, one third were under 30 years of age and 2 had had localized lesions for more than six years.

Since manifestations of early cervical cancer may be lacking or confused by pregnancy changes, it is obvious that a new approach is necessary, namely, the cervical smear, to be checked by biopsy when results are suspicious or positive or when gross changes suggest the advisability.

DIAGNOSIS OF EARLY CERVICAL CANCER IN PREGNANCY

There is confirmation of the screening value of the cervical smear in nonpregnant women by Schtirbu,[12] Scheffey and others,[13] McSweeney and McKay,[14] Kernodle and co-workers [5] and Parrett, Small and Winn,[15] who reported a total of 270 malignant genital lesions discovered via many thousands of cervicovaginal smears with a high degree of accuracy as checked by biopsy. Isbell and others [16] reported 8 positive smears from 13 cervical cancers in situ and 4 positive smears from 13 questionable preinvasive cancers. In the only available report on the use of smears in pregnancy, Kernodle stated that inflammatory cells from chronic cervicitis and vaginitis due to Trichomonas vaginalis may simulate malignant cells.

CERVICAL CHANGES DUE TO PREGNANCY

Pregnancy changes are extensive and numerous enough to affect both smear and biopsy evaluation, according to three recent significant studies, which, along with Ayre's [17] supported hypothesis that cervical cancer is a disordered growth response to inflammation in the presence of estrogen excess (abnormal cornification) and thiamine deficiency, show why cervical cancer should occur more often in gravid parous women than in nulliparas.

McIlrath and Hellestrand [18] secured cervical biopsies from 77 women through and after pregnancy, noting leukorrhea in 58, among whom inflammation developed in two thirds of the multiparas. Chronologically, microscopic changes were thickening of the squamous epithelium, decidual changes in the stroma as early as ten weeks, increased size and number of glands at four to five months plus secretion and slight hyperplasia of cells, vascularity and edema of the stroma by five to six months and stroma decrease with squamous epithelial thinning and replacement of stroma by glands by six to seven months. Metaplasia was marked in half of the cases, and most of the mucosa shed at birth was regenerated by the seventh to fourteenth postpartum day.

Fluhmann [19] illustrated cervical histology of pregnancy and reported on 89 pathologic specimens, among which were 10 cancers. He described adenomatous proliferation of the cervical glands as a characteristic observation in 32 cervical erosions and, less frequently, papillary outgrowth (of hyperplastic interglandular cervical tissue), inflammation, epidermidalization and hyperactivity of the basal cell layers of the squamous epithelium simulating malignant growth, and decidual reaction.

Among biopsies from 50 cervices of pregnant women taken by Murphy and Herbut,[20] thickening of the superficial squamous layer was found in all cases,

TABLE 2.—*Incidence of Pregnancy in Surgical Cervical Carcinoma Specimens*

Author	Source	Carcinomas	Pregnancy
Machado [25]	.....	500	6 (1.20%)
Zuckerman [23]	Mexico	4,000	7 (0.17%)
Jensen, J.: Nord. med. 21 : 325, 1944	Stockholm	1,168	22 (1.90%)
Maino, C. R., and Mussey, R. D.: Am. J. Obst. & Gynec. 47 : 229, 1944	Mayo Clinic	3,570	26 (0.70%)
Sadugor, Palmer and Reichard [10]	Roswell Park Memorial Institute, Buffalo	4,652	124 (2.60%)
Totals	5 sources	13,890	82 (1.24%)

The relatively high figures of Sadugor and others [10] include 26 women pregnant on admission and 88 in the postpartum period with diagnosis within one year.

TABLE 3.—*Frequency of Cervical Cancer in Three Large Maternity Services*

Author	Hospital	Pregnancies	Cancer
Wilson [7]	Chicago Lying-In	29,719	6 (0.013%)
Ward [6]	Woman's, N. Y. C.	26,274	10 (0.027%)
Hirst	Philadelphia Lying-In	46,806	5 (0.010%)

Two patients of the Chicago series and 2 of the Philadelphia series were admitted from other sources.

10. Sadugor, M. G.; Palmer, J. P., and Reichard, M. C.: Am. J. Obst. & Gynec. 57 : 933-938 (May) 1949.
11. Diddle, A. W.; Ashworth, C. T.; Brown, W. W., Jr., and Bronstad, M. T., Jr.: Am. J. Obst. & Gynec. 57 : 376-380 (Feb.) 1949.
12. Schtirbu, I.: Obst. y. ginec. latino-am. 6 : 201-210 (May) 1948.
13. Scheffey, L. C.; Rakoff, A. E., and Hoffman, J.: Am. J. Obst. & Gynec. 55 : 453-460 (March) 1948.
14. McSweeney, D. J., and McKay, D. G.: N. England J. Med. 238 : 867, 1948.
15. Parrett, V.; Small, C., and Winn, L.: Am. J. Obst. & Gynec. 56 : 360-365 (Aug.) 1948.
16. Isbell, N. P.; Jewett, J. F.; Allan, M. S., and Hertig, A. T.: Am. J. Obst. & Gynec. 54 : 567-583 (Oct.) 1947.
17. Ayre, J. E.: Am. J. Obst. & Gynec. 54 : 363-390 (Sept.) 1947.
18. McIlrath, M. B., and Hellestrand, A. L.: J. Obst. & Gynec. Brit. Emp. 54 : 746-777 (Dec.) 1947.
19. Fluhmann, C. F.: Am. J. Obst. & Gynec. 55 : 133-150 (Jan.) 1948.
20. Murphy, E. G., and Herbut, P. A., to be published as read at regular meeting of the Philadelphia Obstetrical Society, Nov. 4, 1948.

inflammation in 64 per cent (three times more often at the squamocolumnar junction in multiparas than in nulliparas), decidual formation in 22 per cent, epidermidalization in 18 per cent and increased basal layer activity in 6 per cent. There were no complications resulting from these biopsies, bleeding being controlled by cotton packs.

In the belief that the incidence of early cancer of the cervix during pregnancy is more frequent than estimated to date, for several years associates and I have carefully inspected the cervix of each newly registered pregnant woman in the small ward service of Preston Maternity Hospital, Philadelphia, and from biopsies of friable or bleeding cervical lesions have discovered 1 cancer in 2,042 patients. Recently, a long range study has been begun including routine smear tests checked by biopsy, where the smear is positive or suspicious or the cervical lesion warrants, in the same hospital and in one half of the large maternity service of the Philadelphia General Hospital, whereby 1 cancer has been found in 222 pregnancies (table 4).

Smears taken by spatula from the cervix only are most suitable, despite frequent clouding by red blood

TABLE 4.—*Results of Consecutive Papanicolaou Smears from 222 Pregnancies*

Philadelphia General Hospital: 157	
Suspicious	5 (4 class II, 1 class III)
Negative	132
Biopsies	5
Cancer	0
Preston Maternity Hospital: 65	
Positive (?)	1
Negative	64
Biopsies	16
Cancer	1 (grade 3, stage I)

Erosions were common, mostly elevated or papillary; most smears showed many neutrocytes, some histiocytes and many superficial squamous cells (of which one half were keratinized) but few deep or intermediate cells, of which only a small percentage were atypical and only one malignant.

cells. From Preston Maternity Hospital, both smears and biopsies have been studied by Allan D. Wallis, M.D., assistant director, with the cooperation of A. Reynolds Crane, M.D., director, the Ayer Clinical Laboratory, Pennsylvania Hospital; and in Philadelphia General Hospital, with the cooperation of Jefferson Clark, M.D., director of laboratories, by Jos. E. Imbriglia, M.D., experienced research pathologist, aided by our assistant, Maurice L. Brown, M.D.

A word about the cervical biopsies is necessary. By means of the small Schubert punch one or more squamocolumnar points are excised, the cervix well dusted with sulfonamide powder, a 1 inch (2.54 cm.) cotton ball pressed against the cervix, the speculum loosened and the cotton renewed if soaked, and retained until the field is completely dry. There has been only 1 case of excessive immediate bleeding, no delayed hemorrhage, no subsequent infection and no interruption of pregnancy.

MANAGEMENT OF CERVICAL CANCER IN PREGNANCY

There is no unanimity of therapeutic opinion in the complex problem of management of cervical cancer in pregnancy. Maino and associates [21] reported a 33 per cent over-all five year salvage of 24 cases, but a salvage of 57 per cent by total hysterectomy with irradiation in operable, nonviable pregnancies and by cesarean section plus total hysterectomy with postoperative irradiation in operable viable pregnancies.

Sadugor [10] obtained 37.5 per cent five year survival in 36 women pregnant at the time of admission and in 88 women in whom cancer was diagnosed within one year (most within three months) post partum, who were given conservative treatment. The women with viable fetuses were delivered by cesarean section (no hysterectomy); abortions were not induced among the women with nonviable fetuses, but all patients received 400 to 500 r to one port or 100 to 150 r to four ports up to 4,000 r (resulting in abortion of nonviable fetuses at about three weeks), followed by one treatment period, fifty to one hundred hours, of radium therapy equivalent in angstrom unitage to the roentgen ray dosage.

Kobak and others [22] also advise high voltage roentgen therapy in the first trimester of pregnancy followed by radium therapy; but in late pregnancy, if there is no infection, classic cesarean section followed by 4,500 milligram hours of radium in three doses and high voltage roentgen therapy; if there is infection, Porro cesarean section or 1,500 to 3,000 milligram hours of radium therapy and deferred section. Zuckerman [23] recommended, if the lesion is operable, radical surgical intervention plus irradiation up to the seventh month, and salvage of the fetus after the seventh month; and if the lesion is inoperable, radiation therapy up to six months, but after six months hysterotomy followed by radiation therapy.

There is much difference of opinion with regard to the effect of pregnancy on cervical cancer, but all authors agree that vaginal delivery is dangerous in advanced malignant conditions. de Rezende [4] expressed the belief that radium therapy during pregnancy offers less risk than high voltage roentgen therapy. He divided his cases into four therapeutic groups: (1) operable cancer with nonviable fetus, Wertheim's operation and roentgen radiation; (2) operable cancer with viable fetus, Wertheim's cesarean operation and roentgen radiation; (3) inoperable cancer with nonviable fetus, cervicovaginal radium, hysterotomy after death of the fetus with subtotal hysterectomy and later radium and roentgen therapy, and (4) inoperable cancer with viable fetus, cesarean section, radium and roentgen radiation.

Read [24] (London) has given operable cancer of the cervix in pregnancy as one of seven indications for the Wertheim operation; he reported 3 cases, in 1 of which the patient was alive at eight years and in 2, dead at one year. Machado [25] also reported 3 cases of operable cancer with viable fetuses in which Wertheim's operation was performed. J. R. Willson [7] advised examination of all patients with threatened abortion after one week in the presence of bleeding; he stated that the only indication for radical operative measures rather than roentgen and radium therapy is early limited cancer. Willson also recommended abdominal delivery

21. Maino, C. R.; Broders, A. C., and Mussey, R. D.: Am. J. Obst. & Gynec. **48**: 806-823 (Dec.) 1944.

22. Kobak, A. J.; Fitzgerald, J. E., and Freda, V. C.: Am. J. Obst. & Gynec. **49**: 307-321 (March) 1945.

23. Zuckerman, C.: Ginec. y obst. de Mexico **9**: 263-272 (July-Aug.) 1947.

24. Read, C. D.: Am. J. Obst. & Gynec. **56**: 1021-1036 (Dec.) 1948.

25. Machado, L.: An. serv. de obst. d. hosp. **1**: 22, 1947.

for all extensive lesions, preferably by cesarean-subtotal hysterectomy on account of infection, and suggests that the infant's chances may be favored by moderate delay in late stages of pregnancy or preoperative application of radium to the cervix.

Ward[6] divided treatment into three classes: (1) early pregnancy: high supracervical hysterectomy and bilateral salpingo-oophorectomy, followed by irradiation of the stump with high voltage roentgen rays; (2) at six months: if mother chooses, minimal roentgen radiation to the cervix, followed by Porro cesarean section and late, high voltage roentgen radiation; (3) last three months: Porro cesarean section, and irradiation of the stump by high voltage roentgen rays. Jones and Neill[26] stated that risk of an abnormal child as the result of palliative radiation during pregnancy is at least 20 per cent and that the chances for the mother if the cancer is diagnosed near term are poor no matter how treated. Fluhmann[19] reported 10 cases, with 4 women dead at an average of five years (3 who were treated by radium, 1 by hysterectomy) but 6 living at an average of six years (3 who were treated by irradiation only, 1 by hysterectomy and radium, 1 by hysterectomy alone and 1 by radium and hysterectomy).

We present herein data on the disposition of 18 cases of carcinoma of the cervix concomitant with pregnancy from 905 cancers of the cervix reviewed by the Committee for the Study of Pelvic Cancer of the Philadelphia Obstetrical Society, under John Y. Howson, M.D.,[27] chairman, from September 1945 to May 1949, with the assistance of Miss Etta Jones (table 5).

142
950

REPORT OF CASES

Five cases of carcinoma of the cervix from Philadelphia Lying-In Hospital are summarized in the following reports.

CASE 1.—Mrs. R. B. (Dr. J. Vernon Ellson), aged 30, unipara, secundigravida, was admitted July 7, 1941, two months pregnant, for discharge and bleeding of twelve weeks' duration. Biopsy of tissue from anterior and posterior internal large fungating cervical mass revealed anaplastic stage 2 squamous cell cervical carcinoma, with acute and chronic inflammation. After twelve exposures to high voltage roentgen rays, she was again admitted Aug. 18, 1941 for symptoms of abortion. On Sept. 15, 1941 treatment of the uterocervical-vaginal area with 50 mg. radium for 100 hours was instituted. The patient was living and well in May 1949.

CASE 2.—Mrs. O. B. (Dr. Clifford B. Lull), aged 39, bipara, tertigravida; was admitted Oct. 1, 1942, five months pregnant, for slight vaginal bleeding and discharge, after diagnosis elsewhere of squamous cell cervical cancer, grade 1, stage 1. Eleven exposures to high voltage roentgen rays, four ports, total for each 1,875 r, 200 kilovolts, 50 cm. distance, through 1 mm. aluminum and 0.5 mm. copper, were given directly after admission. After cervical dilatation and artificial rupture of membranes Nov. 12, 1942, late abortion of a dead fetus occurred November 13. On December 17, 60 mg. of radium were inserted uterovaginally for one hundred hours, resulting in uncomplicated progress of the patient and satisfactory condition to 1949.

CASE 3.—Mrs. L. De M. (ward service), aged 34, octipara, was admitted Feb. 19, 1939, after clinic biopsy at three months for spotting and cramps for several months due to fungating, friable grade 3, stage 3, squamous cell cancer of the cervix. On February 21 vaginal treatment with radium was instituted via 50 mg. bomb and 50 mg. colpostat for forty-eight hours. On April 17 spontaneous complete abortion of the dead product of conception. The first of two series of high voltage roentgen therapy (April 5 to 28, 1939 and Nov. 10 to Dec. 7, 1939) was followed August 12 by insertion of 50 mg. of radium in the cervical canal for twenty-four hours; treatment failed to prevent rectal involvement, leading to fistula, ureteral stricture with hydronephrosis and death.

CASE 4.—Mrs. M. P. (from my service, Preston Maternity Hospital), aged 27, quadripara, registered June 2, 1943, in the fifth month of pregnancy. Immediate biopsy from grossly typical cervical cancer associated with slight staining for four months showed grade 1, stage 1 squamous cell cancer, treated by (1) high voltage roentgen rays, thirteen exposures to four ports, each 15 by 20 cm., total skin dose to each part 1,950 r, 200 kilovolts at 50 cm. with 1 mm. aluminum, 0.5 mm. copper filtration. Spontaneous late abortion of the dead fetus occurred August 4; (2) 60 mg. radium uterovaginally for one hundred hours, August 17. This patient was living and well with negative Papanicolaou vaginal smear April 23, 1949.

CASE 5.—Mrs. D. S. (from my service, Preston Maternity Hospital), registered Feb. 16, 1949, aged 30, when three and three-fourths months pregnant; she had no symptoms, but a minute spot of leukoplakia on the anterior cervical lip. Papanicolaou cervical smear was considered suggestive of cancer, and multiple biopsies indicated positive intraepithelial carcinoma in

TABLE 5.—*Disposition of 17 Cases of Squamous Cell Carcinoma and 1 Case of Choriocarcinoma of the Cervix During Pregnancy Among 905 Malignant Cervical Lesions*

Grade	No.	Stage	No.
In situ	1	In situ	1
1	2	1	9
2	2	2	6
3	2	3	2
4	2	4	0
Doubtful	9		

Ages:	
21 to 41, average 31.7 years	
Symptoms:	
None	3
Bleeding during pregnancy, 5; after, 3	8
Abortion	3
Discharge (fetid)	1
Discharge and bleeding during pregnancy, 1; after, 1	2
Pain, bleeding and discharge during pregnancy	2
Diagnosis:	
At or after abortion	5
Early postnatal exam. 6, late 3	9
During pregnancy:	
Via biopsy	4
Via smear and biopsy	1
Delay in Diagnosis (35.5%):	
Patient	4
Physician	4
Patient and physician	2
Treatment:	
During Pregnancy:	
Cesarean section, roentgen ray radium	2
Cesarean section, panhysterectomy	1
Panhysterectomy	2
After Pregnancy:	
Panhysterectomy (death)	1
Radium	2
Roentgen ray and radium	5
Roentgen ray (vaginal and pelvic), Wertheim's operation	1
Wertheim's operation	2
Meigs operation (by Meigs)	1

From the Committee for the Study of Pelvic Cancer, Philadelphia Obstetrical Society, John Y. Howson,[27] chairman.

26. Jones, H. W., Jr., and Neill, W., Jr.: Am. J. Obst. & Gynec. 48: 447-463 (Oct.) 1944.
27. Howson, J. Y.: Am. J. Obst. & Gynec. 58: 538-540 (March) 1949.

situ, according to three pathologists. On March 11 total abdominal hysterectomy (with bilateral salpingo-oophorectomy) showed early epidermoid carcinoma, grade 3, invasive, stage 1, from a soft granular tumor of the anterior endocervix. This was followed by satisfactory condition and examination with negative vaginal smear April 9, 1949, and a full course of high voltage roentgen therapy similar to that in the preceding case (figs. 1, 2 and 3).

Fig. 1 (case 5).—Smear suggestive of preinvasive cervical cancer in woman four months pregnant, without symptoms.

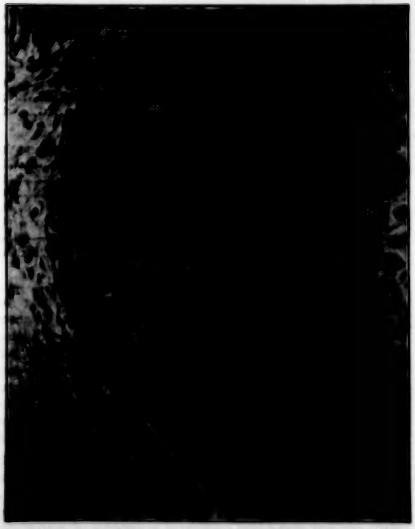

Fig. 2 (case 5).—Biopsy indicating preinvasive cervical cancer in woman four months pregnant, without symptoms.

SUMMARY AND CONCLUSIONS

1. The literature of the last five years bearing on cancer of the cervix in pregnancy has been considered; 23 new cases have been added, and a preliminary report of a long range plan for the detection of early cancer has been presented, with results of 222 cervical smears from which 1 malignant lesion was found.

2. Carcinoma of the uterine cervix, including preinvasive cancer, is more frequent than the child-bearing age would indicate, namely, 0.09 per cent in our series of 2,264 pregnancies.

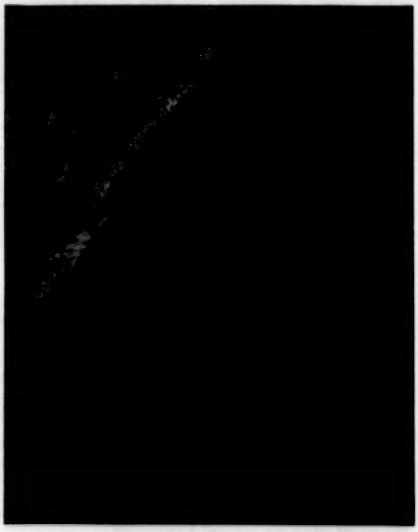

Fig. 3 (case 5).—Photomicrograph of specimen from hysterectomized cervix showing grade 3, stage 1, higher invasive epidermoid carcinoma.

3. Inspection of the cervix is advisable twice during pregnancy and for symptoms of threatened abortion of more than one or two weeks' duration.

4. Papanicolaou cervical smears appear to be reliable in pregnancy for screening purposes and should be done frequently.

5. Cervical punch biopsy is safe and reliable during pregnancy, with due regard to histologic changes incident to pregnancy.

6. Irradiation only, preceded by cesarean section if the fetus is viable, offers a sound method of treatment, although Wertheim's operation is practicable for early cancer in early pregnancy or after cesarean section.

7. Delay in diagnosis and treatment is common in pregnant women.

500 North Twentieth Street (30).

ABSTRACT OF DISCUSSION

DR. W. O. JOHNSON, Louisville, Ky.: The possibility of the existence of carcinoma of the cervix complicating pregnancy being kept in the physician's mind removes the greatest drawback to its early diagnosis. Visualization of the cervix in vaginal discharge or bleeding and cytologic screening studies or biopsies of all suspicious cervical lesions confirm the diagnosis of carcinoma of the cervix in the pregnant or nonpregnant cervix. The signs and symptoms of carcinoma of the cervix are no different in the pregnant woman than in the nonpregnant woman but are sometimes confused with other observations in the pregnant woman. Benign lesions of the cervix should not be treated during pregnancy. Only after the cervical lesion has been diagnosed as malignant by a competent pathologist should radical procedures of treatment be instituted. Dr. Hirst points out that a more comprehensive and better understanding of the cervices in the three trimesters of pregnancy is needed, for there is still much controversy over cervical lesions during pregnancy because standard variations in the cervix in pregnancy have not been accepted. Abdominal delivery is the procedure of choice in emptying the uterus in carcinoma of the cervix with pregnancy. This method avoids excessive bleeding, infection and possibility of more rapid spread of the lesion into the pelvic structures. I differ with Dr. Hirst in my belief (1) that all patients with early cancers in group 1 and group 2 should have radium therapy of the local lesion, an average of 4,500 to 5,000 mg. hours, roentgen ray therapy where it is indicated and Wertheim operation when possible, with the pregnancy interrupted by hysterotomy as soon as possible. (2) In the operable cases with viable fetuses Wertheim section should be performed with roentgen radiation to 8,000 r through five portals as tolerated. If the response is satisfactory, local application of radium and in six weeks radical operation should follow if possible. (3) In the inoperable carcinoma with a viable fetus the patient should have cesarian section with palliative roentgen and radium therapy to tolerance, and careful watching of the response to radium and roentgen therapy with cytologic studies or biopsies. If response is satisfactory, radical surgical measures may be instituted later. (4) In the inoperable patient with a nonviable fetus there should be instituted cervicovaginal radium and roentgen therapy with Porro hysterectomy later.

DR. JOSEPH W. KELSO, Oklahoma City: I have to date subjected 56 women to the radical Wertheim hysterectomy plus bilateral lymphadenectomy, and in 4 of these the carcinomas were complicated with pregnancy. One patient was three weeks pregnant at the time of surgical intervention; carcinomas were diagnosed in 2 patients within four weeks after delivery, and the fourth was admitted four months post partum. It will be of interest to know the outcome of these 4 cases five years from now. One patient was alive three and one-half years after the operation, 2 were well and alive at the end of two and one-half years and 1 underwent operation only a short time ago. In surgically treated malignant lesions complicated with pregnancy, one would have expected evidence of existing cancerous growth to have developed in these first 3 patients by this time, inasmuch as lesions usually recur within eighteen months of the time of treatment.

DR. JOHN C. HIRST, Philadelphia: I personally favor nothing but irradiation in most cases of cancer of the cervix complicated with pregnancy. I recognize that in the early operable cases the results with radical surgery should be good. The cases included in the survey of the Philadelphia Cancer Committee, which has been in existence only three years, are so recent that I am unable to give the results with any degree of significance. However, there was only 1 death from operative treatment, and the large majority of the remaining patients are relatively well. In 4 of the 5 cases from my hospital patients were treated by irradiation only. Four of them are living and well, and 1 of the four was only treated several months ago; hence the series there was too small and 1 case was too recent to give a definite result.

QUESTIONS AND ANSWERS

ON PAPERS BY DRS. NIEBURGS AND PUND, ODELL AND BURT, AND HIRST

DR. G. A. HAHN, Philadelphia: Was there any attempt at correlation between clinical observations and the occurrence of an abnormal vaginal or endocervical smear? It is my impression that it is most unusual for a cytologic smear to be positive and be confirmed by biopsy later unless the cervix is clinically abnormal (clinical diagnosis of carcinoma, "suspicious erosion," eversion, erosion or heteroplastic endocervical tissue).

DR. H. E. NIEBURGS, Augusta, Ga.: In 80 per cent of all cases of preinvasive cervical cancer there was no clinical evidence of cancer of the cervix, though erosion or ectropion was not an infrequent observation. Most slides were sent in by outside physicians and were taken as a routine procedure. Of those cervices seen by us the greatest number failed to show any evidence of malignant growth. Since most cervical cancers arise in the junction of the squamous and columnar epithelium it is easily understood why signs are not present in the incipient phase.

QUESTION: Will you please explain the histologic nature and pathologic significance of the "reserve cell"?

DR. H. E. NIEBURGS, Augusta, Ga.: Reserve cell proliferation occurs in the columnar epithelium of the endocervix. If the hyperplastic reserve cells differentiate, squamous metaplasia results; however, if the reserve cells become anaplastic, neoplasia occurs.

DR. LEWIS C. SCHEFFEY, Philadelphia: Is it not the obvious conclusion that the connection of any abnormal cervix, either by circular biopsy and endothermic resection or by surgical amputation (with thorough histologic study of the removed tissues) will do more to reduce the mortality from cervical cancer than any other factor, either minutely diagnostic or improved and extended therapeutic measures, either radiologic or surgical?

DR. ROY W. MOHLER, Philadelphia: My stand in the symposium has been that we should try to set a standard for a normal cervix. It is important to recognize and make a careful study of every cervix that is not normal.

DR. CRAIG D. ELLYSON, Waterloo, Iowa: The premarital examination of a woman aged 23 revealed what appeared to be a complete cervical erosion. The only symptom was slight increase in vaginal secretion for three months immediately after menses. Biopsy was reported as negative for cancer, but with multiple areas of leukoplakia. Is this common, and is it an end result of the decided activity of heteroplastic endocervical tissue?

DR. ROY W. MOHLER, Philadelphia: We have to understand such a term as leukoplakia in order to answer this. The changes in the cervix have been induced by the existence of the heteroplastic endocervical tissue. In other words, the heteroplastic cervical tissue had been destroyed earlier, or these areas of leukoplakia probably would not have existed.

DR. LESTER D. ODELL, Chicago: Dr. Wallace wondered about the significance of the enzyme glucuronidase in the body. It is my own belief that mitotic activity is the principal reason for the enzyme in cervical cancer. Dr. Wallace brought up the question whether the uninvolved portion of the cervix was elevated in glucuronidase activity as well as involved carcinoma. We have studied both the uninvolved and the involved portion, and the glucuronidase activity of the uninvolved portion is perfectly normal, the involved portion being the only one with elevated values. I should like to emphasize the importance of histologic controls. One cannot simply obtain a positive biopsy and then obtain another tissue specimen and be assured that one will get carcinomatous tissue. Dr. Schmitz mentioned irradiation, concerning which I am extremely cautious. I would like to follow the patients who have received radiation therapy and find out what happens to them after two or three years. We have been able to detect 3 cases of recurrence in carcinoma of the cervix, which was confirmed in 2 instances, in one instance at biopsy and in another instance by surgical operation.

DR. HELEN M. ANGELUCCI, Philadelphia: What procedure is followed in glucuronidase assays in the presence of vaginal trichomoniasis?

DR. LESTER D. ODELL, Chicago: We have usually checked for the presence of trichomonads by a hanging drop examination in our patients with positive assays. When trichomonads are present, of course, they constitute a complicating factor. I do not know of any satisfactory treatment.

QUESTION: What is the treatment of choice in preinvasive carcinoma, or so-called carcinoma in situ?

DR. ELEANOR S. PERCIVAL, Montreal, Canada: As far as carcinoma in situ is concerned, it is of first importance to confirm the diagnosis by biopsy. After a definite diagnosis has been made the condition can be treated by radiation or by hysterectomy. Perhaps there is a tendency now to study the section further by removing the uterus. Either radiation or surgical treatment should cure the condition.

DR. EARLE M. WILDER, Baltimore: Is it known that cervical cauterization or conization decreases the incidence of carcinoma of the cervix?

DR. JOHN C. HIRST, Philadelphia: In pregnancy, cervical cauterization is certainly dangerous and completely out of order, but after pregnancy, all would agree that cauterization or conization should not be depended on to destroy carcinoma. It certainly can be depended on to decrease the likelihood of malignant growth later.

ACUTE POLIOMYELITIS

Relation of Physical Activity at the Time of Onset to the Course of the Disease

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It has often been observed by clinicians that certain patients with paralytic poliomyelitis give a history of severe exertion immediately preceding the onset of paralysis. The inference has been that perhaps undue exertion in some way precipitated the paralysis. Trauma preceding onset has also been mentioned as a possible predisposing cause. Recently it has been postulated on both clinical and theoretic grounds that physical activity at a crucial time might be one of the factors which determines the degree of spread of virus in the central nervous system and therefore the severity of the disease.[1] Levinson, Milzer and Lewin studied experimentally the effects of fatigue, chilling and mechanical trauma during the incubation period on the resistance of rhesus monkeys to poliomyelitis.[2] They found that the incidence and severity of paralysis was greater in monkeys subjected to exhausting exercise or chilling than in control animals; no correlation was demonstrated between trauma to one or more limbs and the incidence or site of paralysis. Russell,[3] using a clinical and statistical approach to the problem, collected data on 100 patients, chiefly adults who were seen in the British epidemic of 1947. He showed that a large percentage of patients in whom moderate or severe paralysis developed gave a history of continuing physical activity after the onset of symptoms; conversely, a large percentage of those who remained nonparalytic gave a history of bed rest or minimal activity immediately following the appearance of symptoms. Hargreaves has confirmed these observations on a smaller series of patients in the same epidemic.[4] The present study was undertaken to extend Russell's and Hargreaves' observations to include patients of several age groups and to include two different epidemics, widely separated geographically.

Aided by a grant from the National Foundation for Infantile Paralysis, Inc.

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This article has been abbreviated in THE JOURNAL by omission of tables 3, 6, 7, 9, 10 and 12. The complete text will appear in the author's reprints.

1. Horstmann, D. M., and Paul, J. R.: The Incubation Period in Human Poliomyelitis and Its Implications, J. A. M. A. **135**:11 (Sept. 6) 1947.

2. Levinson, S. O.; Milzer, A., and Lewin, P.: Effect of Fatigue, Chilling and Mechanical Trauma on Resistance to Experimental Poliomyelitis, Am. J. Hyg. **42**:204 (Sept.) 1945.

3. (a) Russell, W. R.: Poliomyelitis: The Pre-Paralytic Stage, and the Effect of Physical Activity on the Severity of Paralysis, Brit. M. J. **2**:1023 (Dec. 27) 1947; (b) Paralytic Poliomyelitis: The Early Symptoms and the Effect of Physical Activity on the Course of the Disease, ibid. **1**:465 (March 19) 1949.

4. Hargreaves, E. R.: Poliomyelitis: Effect of Exertion During the Pre-Paralytic Stage, Brit. M. J. **2**:1021 (Dec. 11) 1948.

5. I was assisted in this study by members of the medical staffs and by physical therapists of all the hospitals where cases were studied and by the health officers in North Carolina and California; special help was received from Drs. Dora Tolle, Willard Parker Hospital, New York; C. P. Stevick, State Board of Health, Raleigh, N. C., and A. G. Bower, Los Angeles County General Hospital, Los Angeles.

MATERIALS AND METHODS

During 1948 two large epidemics of poliomyelitis occurred in the United States, one in North Carolina and one in Los Angeles County, California. One hundred and eighty-seven cases in various parts of North Carolina and 208 cases from Los Angeles County were studied. In addition, 16 cases from the city of New York were included with the North Carolina group, making a total of 411 cases for all three areas.[5] Table 1 indicates the composition of the groups of patients investigated. An effort was made to have approximately equal numbers of the various types of disease in each age group so that adequate comparisons could be made.

The data on all patients were collected firsthand by me so that the same specific questions could be asked and the same evaluation of the answers could be made. Most of the histories were taken directly from the patients while they were in hospitals in North Carolina, California and New York City, but some of the nonparalytic patients in North Carolina were interviewed in their homes. A complete clinical history was obtained, from the patient if he was old enough, or from one or both parents of the young children. Following this, a detailed account of the patient's physical activities for the three days prior to onset and the three days after onset of symptoms was recorded.

TABLE 1.—*Distribution of Age Groups and Types of Poliomyelitis in 411 Cases from Three Epidemics, North Carolina, New York City and Southern California*

Age	Non-paralytic (100)	Paralytic (248)				Bulbar (63)		
		Slight	Moderate	Severe	Very Severe	Slight	Moderate	Severe
2 to 4	18	15	14	19	9	0	2	4
5 to 9	22	17	15	16	11	3	6	17
10 to 14	26	9	9	13	7	4	9	9
15 to 19	17	7	9	15	9	1	0	4
20	17	5	13	15	21	1	0	3
Total	100	53	60	78	57	9	17	37

In those persons with two distinct phases to their illness, activity histories for three days prior to the onset of the first phase and three days following its onset were taken also. Inquiry was made as to unusual physical exertion as well as ordinary daily activities. Any history of trauma in the period just before onset was also noted. Although some of the histories were taken as long as six weeks or more after onset, the patients seemed to have almost no difficulty in reconstructing the early events related to their illness. With

a large calendar before him the patient (or parent) was asked to describe the symptoms from the beginning. In general, the illness represented so dramatic and important an experience that he was able to give details of everything connected with it. The activities of the days preceding onset were highlighted with the events connected with the onset and hospitalization as points of reference. It was believed that the time relationships given by a few patients were too vague to be reliable; hence, their histories were excluded from the analyses.

The degree of physical activity was scored in a manner similar to that employed by Russell.[28] Morning and afternoon activities were scored separately in the following manner:

O = Bed rest
± = Not more than one-fourth day's light work, e. g., resting in the house with a short walk
+ = Average light work: housework, secretarial and school.
++ = Average or heavy manual work, factory or labor; or school with football or other athletic sports

In analyzing the data, patients were grouped as to age and type of disease; they were divided also on the basis of severity of paralysis according to the scheme adopted by Russell.[28] The designation of severity was based on the status of the muscles two to three months or more after onset, as recorded in follow-up examinations by the physicians and physical therapists in charge of the cases. The following classification was used:

NP	Nonparalytic:	no muscle weakness detected at any time
	Paralytic, slight:	transient or slight paralysis of one or more muscle groups, full recovery expected
P	Moderate:	multiple involvement or more severe involvement of a few muscles of one limb; residual paralysis expected
	Severe:	bilateral severe paralysis at any level including the trunk; or complete paralysis of one extremity
	Very severe:	severe and extensive paralysis, such as of trunk or respiratory muscles or both lower limbs, or severe paralysis of all four extremities

The bulbar cases, 63 in number, were considered separately. They were classified as slight, moderate and severe on the basis of the severity of bulbar signs and cranial nerve paralyses.

The material was analyzed in terms of various stages of the clinical disease: for both before and after onset of the first phase (minor illness) in patients with a biphasic, or "dromedary," course; and for the period preceding and following the onset of the second phase (major illness) in all patients.[6] For purposes of orientation, a schematic diagram of the clinical course of poliomyelitis is shown in figure 1.

6. Terminology used in describing the stages of clinical poliomyelitis is apt to be confusing, and usage has varied from time to time. The term minor illness has been used by Paul, Salinger and Trask ("Abortive" Poliomyelitis, J. A. M. A. 99:1262 [June 25] 1932) to describe the abortive type of poliomyelitis in which the entire disease consists of a brief, nonspecific illness without signs referable to the central nervous system. In such cases the diagnosis of poliomyelitis is only presumptive. In patients who have a biphasic course the minor illness corresponds to the first phase and is followed, after a few days of well-being, by the second phase, in which signs referable to the central nervous system appear. In the majority of patients, however, there is no distinct first phase, and the disease begins with the phase associated with signs referable to the central nervous system. It seems illogical to refer to this as a "second" phase when no first phase has occurred. The term preparalytic, although widely used, is equally objectionable, because in many patients paralysis never appears. In order to overcome these inconsistencies therefore, an arbitrary classification using the terms minor illness and major illness has been used in this paper. The minor illness indicates the first phase; the major illness indicates the phase associated with signs referable to the central nervous system, regardless of whether or not there has been a previous first phase. If the course is one of paralytic poliomyelitis, the first part of the major illness can be considered as the preparalytic period. Thus all patients in whom a clinical diagnosis of poliomyelitis can be made have a major illness, whether their disease is nonparalytic or paralytic in type.

Statistical Analyses of Results.—In tabulating results, it soon became apparent that the trends were the same in patients from North Carolina, New York and California. Except in the fifth table, where the results are shown separately, cases from the three areas were therefore combined to give statistically more useful numbers. In the presentation of the data, unless otherwise noted, nonparalytic and slight paralytic cases have been combined in one group, since the slight paralytic cases consisted chiefly of those in which muscle weakness was of extremely mild nature and short duration, seldom persisting more than two weeks. This group is labeled NP in the tables; P designates moderate, severe or very severe paralytic cases.

THE FIRST PHASE (MINOR ILLNESS)

Physical Activity on the Days Preceding and Following Onset.—Clearcut first phase (minor illness) symptoms were present in about 20 per cent of the cases. Physical activity for each of the three days previous to onset of the first phase in 81 patients was analyzed separately for both nonparalytic and paralytic types. In all instances, the results were so similar that the three day scores were averaged. Table 2 indicates the averaged activity score for patients during the three day period before onset of the first phase, and for the first

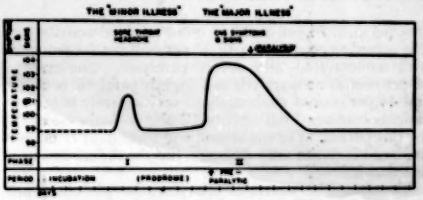

Fig. 1.—Schematic diagram illustrating the clinical course of the childhood type of acute poliomyelitis with special reference to terminology used to describe various phases of the disease.

day and second day after onset. No significant difference was detected between the amount of physical activity during the first phase of illness in those who eventually were nonparalytic or slightly paralytic and in those who eventually became moderately or severely paralytic.

THE MAJOR ILLNESS (SECOND PHASE—PREPARALYTIC PERIOD)

Physical Activity During the Three Days Prior to Onset.—The period of observation of physical activity represents the three days before onset of the major illness; in those patients whose illness followed a biphasic course, it is the period preceding the onset of the second phase. The results, indicated in table 3, show no correlation between severity of activity during this period and severity of paralysis.

Physical Activity During the First Three Days of the Major Illness.—The activity scores for the day of onset and the following two days of the major illness are presented in table 4. Here a difference is apparent between paralytic and nonparalytic groups. Thus, for the day of onset 35 per cent of nonparalytic patients and slightly paralytic persons gave a history of bed rest or minimal activity and 45 per cent of full activity. In contrast, 9 per cent of persons with moderate to severe paralysis had bed rest or minimal activity and 74 per cent continued full activity. The figures for California and

North Carolina cases are shown separately in table 5. They are almost identical with those for the totals.

If the activity scores for the day of onset but only for the period after the actual appearance of symptoms are tabulated, the differences are equally striking (table 4, day of disease 1 †). Of nonparalytic and slightly paralytic persons, 74 per cent had no or minimal activity for this period as compared with 32 per cent for the patients with moderate to very severe paralysis. Conversely, 18 per cent of nonparalytic and slightly paralytic persons and 44 per cent of moderately to very severely paralytic patients continued full activity (2 plus to 4 plus scores) for this period. For the second and third days of illness the trend is in the same direction but the differences are less decided.

To make the contrasts sharper, the persons with slight and moderate paralysis were excluded, and a comparison of degree of activity of nonparalytic and severely or very severely paralytic patients only was made. The results are shown graphically in figure 2 (and in table 6). The figures on these 235 patients (100 nonparalytic and 135 paralytic) are similar to those for the combined nonparalytic and slightly paralytic patients compared with combined moderately, severely and very severely paralytic patients shown in table 4. Thus of severely paralytic patients 49 per cent continued activity on the first day and 36 per cent on the second day after onset, while of the nonparalytic patients only 13 per cent and 8 per cent did so.

The difficulty in ascertaining the exact time of onset is often considerable. Another series of analyses was therefore made, of only those cases in which symptoms appeared suddenly so that there was no question as to the end of well-being and the beginning of illness. These comprised a total of 220 patients, 111 of which were nonparalytic or slightly paralytic, and 109 moderately to very severely paralytic. The activity scores for these persons for the first day of illness after the actual onset of symptoms (table 7) show the same difference between nonparalytic and paralytic patients as do those in table 4, in which all patients with either sudden or gradual onset are considered.

The effect that age of the patients might have on the results was studied. The activity scores for the standard age groups for each type of disease (nonparalytic, and slightly to very severely paralytic) were tabulated separately. Table 8 shows this comparison of activity for the day of onset after the appearance of symptoms. It can be seen that there is a difference between nonparalytic and paralytic patients in each age group, as has already been shown, but a greater percentage of adults appear in the maximum activity group, whether nonparalytic or very severely paralytic. This is what one would expect, since adults are much less likely than children to go to bed at once at the onset of an illness.

Physical Activity After the Onset of Fever.—It was believed that the appearance of fever, like a sudden onset, might give a sharper end point in the measurement of the relationship of physical activity to the outcome of the illness. The activity scores were therefore analyzed for the three days after onset of fever. The data are probably more accurate for the younger age groups, since young children are more apt to have their temperatures taken than are adults, and the onset of fever can therefore be fixed more accurately in them. Nevertheless, the same trend is brought out (table 9) as in table 4, namely, a greater proportion of the nonparalytic group than of the paralytic having had bed rest in the first three days after onset of fever.

TABLE 2.—*Physical Activity Scores for Period Before and During the First Phase, 81 Patients*

Day Before or After Onset Phase 1	Type*	No.	Physical Activity† 0 to ± %	+ %	++ to ++++ %	Statistical Analysis‡ χ^2	P
−3 to −1 (averaged)	NP	46	0	2	98		
	P	33	0	0	100		
+1	NP	46	25	30	45	2.333	0.15
	P	33	12	3	85		
+2	NP	47	34	8	58	4.82	0.1
	P	33	15	0	85		
+3	NP	44	39	9	61	5.09	0.1
	P	33	12	0	88		

* In this and subsequent tables unless otherwise noted NP refers to combined nonparalytic and slightly paralytic patients, while P includes moderately, severely and very severely paralytic patients. Day indicates calendar date.

† Scores as follows:
0 = Bed rest
± = Minimal activity—less than ¼ day (2 hours)
+ = Moderate activity—½ day
++ to ++++ = Full day moderate to heavy activity

‡ In this and subsequent statistical analyses, a probability (p) value of less than 0.05 indicates that there is a statistically significant difference between the figures for type NP and P cases.

TABLE 4.—*Physical Activity During the First Three Days of the Major Illness (Second Phase), 348 Patients**

Day of Disease	Type	No.	Physical Activity 0 to ± %	+ %	++ to ++++ %	Statistical Analysis χ^2	P
1	NP	153	35	20	45	37.34	<0.01
	P	195	9	17	74		
1†	NP	152	74	13	13	56.22	<0.01
	P	196	22	34	44		
2	NP	153	83	6	11	42.8	<0.01
	P	195	49	16	35		
3	NP	153	92	2	6	19.1	<0.01
	P	196	75	16	9		

* Legends as for table 2.

† Corrected; activity score for date of onset after actual appearance of symptoms.

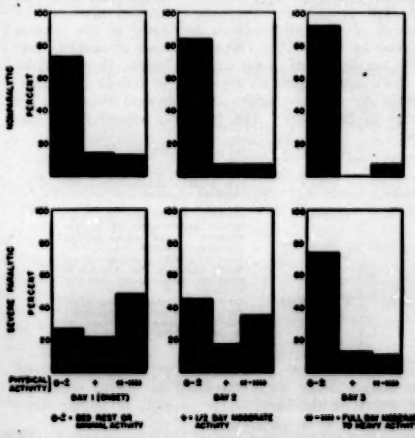

Fig. 2.—The degree of physical activity performed by nonparalytic patients and severely paralytic patients during the early days of the major illness. The height of each vertical column indicates the percentage of those patients, in each of the two groups, who indulged in full, moderate or minimal physical activity.

Physical Activity After the Onset of Symptoms Referable to the Central Nervous System.—For the purpose of this analysis, severe headache, pain, neck or back stiffness were taken as symptoms or signs of the central nervous system. In most of the patients these appeared during the first days following onset, but in some instances signs referable to the central nervous system appeared in the prodromal period, i. e., the few days preceding onset of the major illness. As with previous analyses involving the period after the onset of symptoms, the paralytic group showed a significantly higher percentage of persons who continued activity (table 10). The activity scores of the 31 patients in whom the symptoms of central nervous system appeared during the prodromal period were studied separately. However, the number of nonparalytic patients among these 31 was too few to make valid comparisons between them and the paralytic group.

Physical Activity Immediately Preceding the Onset of Symptoms.—In 140 patients (66 nonparalytic, 74 paralytic) the first symptoms appeared in the afternoon or evening. Because of the concept that exercise immediately preceding onset may have a deleterious effect, the activity scores for these patients for the day of onset, but limited to the period before any symptoms were apparent, were analyzed (table 11). These showed no difference between the activity scores of the nonparalytic and paralytic groups in the period immediately preceding onset of symptoms.

TABLE 5.—*Physical Activity During the First Three Days of the Major Illness (Second Phase), 348 Patients: Comparison of California and North Carolina Plus New York City Cases* *

			Physical Activity					
			0 to ±		+		++ to ++++	
Day of Disease†	Type	No.	Calif. %	N. C. %	Calif. %	N. C. %	Calif. %	N. C. %
1.....	NP	133‡	71	77	17	10	12	13
	P	196§	31	32	23	26	46	42
2.....	NP	132	80	88	6	5	14	7
	P	195	44	34	19	17	37	50
3.....	NP	133	91	93	3	2	6	5
	P	195	76	75	14	18	10	7

* Legends as for table 2.
† Day 1 refers to date of onset, physical activity after appearance of symptoms.
‡ Of 133 NP cases, 79 are from California, 74 from North Carolina and New York City.
§ Of 196 P cases, 89 are from California, 108 from North Carolina and New York City.

Physical Activity Scores for Bulbar Cases.—Of the 63 bulbar cases studied, only 9 were classified as slight, while the other 54 were moderate to very severe. Most of the patients were in the 5 to 14 age group. Analyses of the activity scores for the three days before onset of illness were exactly similar to those for the nonparalytic and paralytic groups, showing no differences between the degree of activity in any of the various types of cases. In contrast to the spinal paralytic cases, however, no difference in the activity scores for slight or severe bulbar cases was detected either for the day that symptoms appeared or for the following day (table 12).

Trauma Preceding Onset.—The incidence of trauma proved to be low and difficult to interpret. Only 22 of the 411 patients gave a history of injury around the time of onset. Ten of these were classified as nonparalytic or slightly paralytic and 12 as paralytic. On the whole, the injuries were minor and of questionably significant type. Several told of having fallen from a bicycle or tricycle; others of having fallen while ice skating or doing acrobatics; two were hit by rocks while playing. Seventeen of the 22 patients were under the age of 12 years. The types of injuries described seemed to be of a sort likely to occur commonly among children and go unnoticed. However, several patients had more severe injuries: One, a girl aged 7, after a day's play so strenuous as to produce exhaustion, fell from her bicycle and sustained a deep cut on the chin which required a number of stitches. The following day fever and abdominal pain developed, and subsequently the disease progressed to severe involvement of all extremities, intercostal muscles and cranial nerves. Another patient, aged 25, had an impacted wisdom tooth extracted on the day before onset: complete paralysis of both legs developed, but she had no involvement of cranial nerves. A boy aged 11 fell flat on his chest while playing football the day before onset. Significant muscular weakness did not develop except for complete paralysis of the intercostal muscles. Two children under 4 years of age had their third typhoid vaccinations around the onset of first phase symptoms; one remained nonparalytic but severe paralysis of both legs and both arms developed in the other, the vaccinated arm being the more severely affected. One boy aged 12 had had chronic osteomyelitis of the left femur for five years, with a draining sinus. His paralysis was limited entirely to the muscles of the left thigh.

TABLE 8.—*Physical Activity Scores for Day of Onset of the Major Illness (Second Phase) by Age Group and Type of Disease. Data for Date of Onset After Actual Appearance of Symptoms* *

			Physical Activity		
			0 to ±	+	++ to ++++
Type	Age	No.	%	%	%
Nonpar. (100)	2 to 9	60	88	5	7
	10 to 14	26	85	4	11
	15 and over	34	47	29	24
Par. slight (52)	2 to 9	32	87	3	10
	10 to 14	8	63	25	12
	15 and over	12	50	25	25
Par. mod. (60)	2 to 9	29	52	17	31
	10 to 14	9	56	11	33
	15 and over	22	23	45	32
Par. severe (78)	2 to 9	35	40	25	35
	10 to 14	13	31	31	38
	15 and over	30	17	23	60
Par. very severe (57)	2 to 9	20	30	20	50
	10 to 14	7	14	14	72
	15 and over	30	23	23	54

* Legends as for table 2.

TABLE 11.—*Physical Activity Scores for the Hours Immediately Preceding Onset, 140 Patients with Onset After Noon* *

		Physical Activity			Statistical Analysis	
		0 to ±	+	++ to ++++		
Type	No.	%	%	%	χ^2	p
NP	66	11	30	59	5.35	0.2
P	74	3	25	72	....	...

* Legends as for table 2.

Relation of Type of Physical Activity to Site of Paralysis.—It has been suggested that if one particular muscle group is exercised excessively at a critical time in the early illness, that muscle group is more liable to paralysis than are others.[25b] In the attempt to analyze the cases in the present series for this type of correlation, it became apparent that any form of physical

activity is so complex that it is usually impossible to separate its components sharply enough to make valid estimations. The few instances in which it can be done, although they afford interesting case histories, are not of statistical significance. Therefore it was decided to use another approach to the problem. When the histories were taken, the handedness of each patient had been recorded. Of the paralytic patients, 186 were right-handed (and therefore right-footed) and 28 were left-handed (and left-footed). These cases were analyzed as to site of paralysis, i. e., whether right or left side was more severely involved, or whether both sides were about equally involved. The results are shown in table 13. There appears to be a slightly higher incidence of paralysis on the left rather than on the right side in left-handed patients. The converse is true for right-handed patients, although the differences were less decided. The correlation is statistically significant as indicated by the chi square (χ^2) and probability (p) values.

TABLE 13.—*Handedness and Site of Paralysis, 214 Patients*

		Right Side More Involved Than Left		Left Side More Involved Than Right		Right and Left Sides Equally Involved	
	No.	No.	%	No.	%	No.	%
Right-handed	186	51	28	36	19	99	53
Left-handed	28	2	6	13	47	13	47

$\chi^2 = 9.78$ $p = 0.01$.

COMMENT

The data presented in tables 4 to 13 indicate that the percentage of patients who continued physical activity after the appearance of symptoms of the major illness was considerably greater in the paralytic group than in the nonparalytic. This was true whether activity was measured after the appearance of fever, of central nervous symptoms or of any symptom at all. No correlation was demonstrated between physical activity during the first phase or minor illness and the final outcome.

The critical time, as far as physical activity was concerned, seemed to be the first twenty-four to forty-eight hours of the major illness—during which time the symptoms were often mild. There was no correlation between severity of paralysis and activity of the patient immediately preceding onset. Surprisingly few patients (only 7) gave a history of exertion out of the ordinary for them, although many indulged in strenuous exercise the day before onset or the day of onset. The common observation of unusual exertion immediately preceding paralysis was therefore not corroborated in a strict sense. Actually, however, since paralysis as the presenting symptom is extremely rare, it would seem likely that the patients described in the literature probably were not entirely well at the time of severe exercise, but had minor symptoms which they had discounted. They would then fall into the pattern demonstrated—of physical activity after the appearance of symptoms being correlated with severity of paralysis.

Although there were 22 patients with a history of trauma, these were divided almost equally between the paralytic and nonparalytic groups. Several patients sustained trauma to limbs which were later the site of muscle weakness, but these were too few to have statistical significance.

The fact that there was no correlation between degree of physical activity and severity of paralysis among the patients with bulbar poliomyelitis raises problems with regard to the meaning of the positive correlation in the spinal cases. Presumably there is some difference between bulbar and spinal forms of the disease which accounts for this. Among other factors, the obvious one of difference in site of virus localization no doubt plays an important role.

The nature of the relationship between physical activity after onset and severity of paralysis is not necessarily one of simple cause and effect. In fact it might be that the patient is impelled to physical activity during the early part of his illness as a result of the disease process. The story of extraordinary irritability and restlessness, sometimes accompanied with excruciating back pain which can be relieved only by walking about continually, was encountered frequently in young adults in the present series of cases. Russell has reported similar observations.[8] However, restlessness in most of the patients did not take this extreme form. In the majority of those who continued physical activity after onset, there was simply a story of continuing the usual round of daily endeavor, whether it involved riding a tricycle or working in tobacco fields, until prevented from doing so by severity of symptoms.

Another possible explanation of the relationship between exertion and paralysis is that physical activity at a crucial time may in itself exert a deleterious effect —either directly or indirectly—on the course of the disease. If the effect is direct, one must assume that the anterior horn cell can be influenced by its peripheral connections. There is some evidence to support this. Hydén[7] has shown that in the normal experimental animal intense muscular work depletes the anterior horn cells of their protein content. Howe and Bodian[8] have found that the susceptibility of anterior horn cells to poliomyelitis virus is altered by section of the peripheral nerve originating in these cells: during the period when the cell is regenerating its neurone, it was found to be insusceptible to experimental infection.

There is also evidence, both clinical and experimental, that virus is present in the central nervous system some time before paralysis. Neurologic symptoms, such as hyperesthesia, paresthesia and pain early in the clinical course or even in the prodromal period, are frequent.[9] Bodian and Cumberland have shown that in the monkey, the onset of virus multiplication and the resultant cellular pathologic reaction in the central nervous system precedes the onset of paralysis by at least one day and often several days.[10] In terms of the human disease, this suggests that early in the illness, before the appearance of paralysis, the central nervous system has been invaded and many cells are already undergoing pathologic change due to multiplication of virus. What determines whether, in an infected cell, the pathologic process stops at a reversible stage or goes on to irreversible damage or complete destruction? Could physical activity influence the process? Probably many factors are involved: dosage, strain of virus, virulence of the agent as well as the degree of immunity of the host and other unknown factors. These no doubt interplay in setting a pattern for an individual patient. In some patients the pattern from the start may be one of widespread and severe destruction, and nothing can

7. Hydén, H.: Protein Metabolism in the Nerve Cell During Growth and Function, Acta physiol. Scandinav. (supp. 17) 6:1, 1943.

8. Howe, H. A., and Bodian, D.: Neural Mechanisms in Poliomyelitis, New York, The Commonwealth Fund, 1942.

9. Horstmann, D. M.: Clinical Aspects of Acute Poliomyelitis, Am. J. Med. 6:592 (May) 1949. Russell.[8]

10. Bodian, D., and Cumberland, M.: The Rise and Decline of Poliomyelitis Virus in Infected Nervous Tissue, Am. J. Hyg. 48:226, 1947.

alter it. In others the pattern may be one of mild or minimal invasion and destruction; in these conceivably it can be altered by any factor which upsets the nerve cell metabolism in such a way as to favor continued multiplication of virus. It is possible that physical activity at a crucial time might act as such an influence and might result in the complete destruction of cells which would otherwise have been the site of reversible changes.

SUMMARY

Four hundred and eleven patients with poliomyelitis from three epidemics were studied with reference to the amount of physical activity which they performed around the time of onset of their illness. The analyses revealed that physical activity performed at the time of the first phase or prior to onset of the second phase was not associated with an increase in the subsequent development, or the severity of paralysis. However, when physical activity was performed after the second phase or major illness it was associated with a significant increase in the incidence and severity of subsequent paralysis. Correspondingly, a significantly higher percentage of nonparalytic than paralytic patients gave a history of bed rest or minimal activity during the early stages of the major illness.

The possible implications of these observations are discussed in terms of the pathogenesis of the disease.

SEQUELAE OF MENINGITIS DUE TO HEMOPHILUS INFLUENZAE

An Analysis of Forty-Four Cases

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Although there are numerous reports on the relative merits of various therapeutic agents in the treatment of influenzal meningitis, little has been written on the postinfectious sequelae of this disease. With the advent of increasingly more efficacious therapy and the consequent decrease in the mortality rate, the occurrence of sequelae assumes greater importance in determining the ultimate prognosis. The present study was undertaken, therefore, to evaluate the status of 44 patients who had had influenzal meningitis.

The patients, the majority of whom lived in the city, were from an area within a radius of one hundred and fifty miles of the city of Louisville, Ky. All were given treatment at the Louisville General Hospital or the Children's Free Hospital in Louisville from January 1945 to December 1948.

Twenty-nine of the 34 living patients were reexamined. Emphasis was placed on general physical condition, developmental level and neurologic and electroencephalographic studies. All neurologic examinations except three were made by the same person (B. B.), and all developmental level tests (using standard Gesell tables) were made by the same person (R. G.).

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SEASONAL VARIATION

Sixty-six per cent of the patients were admitted to the hospital during the months of November, December, January and February. The remainder were admitted during the other eight months of the year. One patient was admitted in each of the months of March, May and October.

AGE DISTRIBUTION

Forty of the 44 patients were 36 months of age or less. Nineteen patients were 9 months of age or less. The ages of the 4 patients above 36 months of age were 4, 5, 6 and 18 years.

MORTALITY

The fatality rate for the 44 cases was 22.7 per cent. In the analysis of age and mortality (table 1) the 44 patients were divided into two groups, those 9 months of age or less and those over 9 months.

TABLE 1.—*Analysis of Age and Mortality*

Age	Number of Cases	Lived	Died
9 mo. or less	19	11	8
Over 9 mo.	25	23	2

Nineteen patients were 9 months of age or less, and of these 8 died (case fatality rate, 42.1 per cent). Twenty-five patients were over 9 months of age, and of these 2 died (case fatality rate, 8 per cent). The difference in the mortality rate below and above the 9 months' age level is statistically significant. The critical age of 9 months becomes more significant when the 2 deaths of patients over 9 months of age are analyzed. An error of therapy contributed chiefly to the death of 1 patient, while the other patient died within twenty-four hours after admission.

RESULTS

The interval between hospital discharge and follow-up examination varied from five months to four years. Four patients were discharged in 1945, 6 patients in 1946, 6 patients in 1947 and thirteen patients in 1948. All but 1 were discharged more than six months prior to the follow-up examination. The deaths occurred in the following years: 1945, 3 patients; 1946, 1 patient; 1947, 2 patients, and 1948, 4 patients.

In five cases the patients were not available for examination, and the remaining 39 cases were classified in three groups: (1) deaths, 10 cases; (2) poor results, 11 cases, and (3) good results, 18 cases.

The group in which there were poor results included all patients who showed retarded developmental level, behavior problem (1 case) and/or severe neurologic deficits. The group with good results included those patients who showed a developmental age equivalent to or better than chronologic age and minimal neurologic residua.

DURATION OF ILLNESS AND RESULTS

The duration of illness before a diagnosis of meningitis was made varied little among the groups. Among the patients who died (10 patients), the duration of illness varied between one and twelve days, with 1 patient ill twenty-one days. The average was 6.2 days. Among patients in the group with poor results (11 patients), the illness varied between one and fourteen days, with 1 patient ill for five weeks. This patient, who was treated for an infection of the respiratory tract, received sulfadiazine and penicillin intermittently, which proba-

bly protracted his course. If the patient who was ill for five weeks is excluded, the average was 5.9 days. In the group in which there were good results (18 patients) the period of illness varied between one and twelve days, with 1 patient ill for twenty-one days. The average period of illness was 6.9 days.

THERAPY AND RESULTS

Ten patients received sulfadiazine and penicillin. Four patients were treated with only sulfadiazine and streptomycin. Twenty-five patients received sulfadiazine, penicillin and streptomycin. Fifteen patients were given antiserum in addition to the previously mentioned combinations. Seventy-four per cent of the patients received a combination of sulfadiazine and streptomycin; in addition, most of the latter group also received penicillin or antiserum.

No significant correlation between the treatment and results was noted. Patients treated in a like manner in each group were too few to permit a general statement as to therapy and results. Attempts were made to determine whether intrathecal medication had any effect on the results, but no positive correlation was noted.

SPINAL FLUID OBSERVATIONS AND RESULTS

Among the patients who died, the sugar level in the spinal fluid initially varied between 10 and 74 mg. per hundred cubic centimeters. The average was 31.5 mg. per hundred cubic centimeters. In the group with poor results the extremes were 10 and 47 mg. per hundred cubic centimeters, with an average of 23 mg. per hundred cubic centimeters. In the group with good results the extremes were 6 and 61 mg. per hundred cubic centimeters, with an average of 30.9 mg. per hundred cubic centimeters. The time of sterilization of spinal fluid in each group could not be compared because of an insufficient number of successive cultures.

Table 2.—*Analysis of Seizures*

Group	Number of Patients	Patients with Seizure	
		Number	Percentage
Good results	16*	3	18.7
Poor results and deaths	71	15	71

* Two cases omitted.

ANALYSIS OF CONVULSIONS AND RESULTS

Of the 18 patients in the group with good results, 2 were excluded from the analysis because 1 had had epilepsy prior to his meningitis and the other had a past history strongly suggestive of petit mal epilepsy. Of the remaining group of 16 patients, 3 had one or more convulsive seizures during their illness and 13 had no seizures, a seizure incidence of 18.7 per cent. In the group with poor results and in the group of fatalities (21 patients) 15 patients had one or more seizures, a seizure incidence of 71 per cent. The incidence of seizures is not significantly different in a separate analysis of the 10 deaths. It is of interest that no patient in the group with good results had had any further seizures to the time of writing, whereas 2 of the 11 living patients from the group with poor results had had frequent focal, tonic and/or myoclonic seizures and 2 others had severe temper tantrums (possible psychomotor epilepsy). Pertinent data are in table 2.

CORRELATION OF ELECTROENCEPHALOGRAPHIC STUDIES WITH CLINICAL STATUS AND SEIZURES

In correlating encephalographic and clinical status we excluded the 2 patients with past history of known or probable epilepsy. The electroencephalographic examinations were performed on 21 patients; 12 of these were in the group with good results and 9 were in the group with poor results. All electroencephalograms were recorded with a standard eight channel Grass instrument. Fourteen of the twenty-one electroencephalograms (66.6 per cent) were abnormal, showing slow activity, focal abnormality, amplitude asymmetry or generalized dysrhythmia. Of these fourteen there were six (42.8 per cent) with focal abnormalities: two with slow wave and slow spike foci, three with moderately fast activity (14 to 32 cycles per second) and one with amplitude asymmetry. Of the remaining eight abnormal nonfocal electroencephalograms, five were classified as moderately slow and three were dysrhythmic. Of the total of twelve electroencephalograms made on patients in the group in which there were good results, seven (58.3 per cent) were abnormal; of these seven, four were focal. Of a total of nine electroencephalograms on patients in the group with poor results, seven (77.7 per cent) were abnormal. Two of these were of a focal nature.

NEUROLOGIC SEQUELAE

Neurologic examination of the 18 patients comprising the group with good results revealed no abnormalities in 8 (44.4 per cent). Nine patients (50 per cent) demonstrated only minimal neurologic deficits, such as slight reflex differences and/or positive Babinski or Chaddock's signs. There was only 1 patient with sequelae of any great significance, and, although he had bilateral nerve deafness, he was handicapped little.

One patient, of the 11 with poor results, presented such a behavior problem that an adequate neurologic examination could not be made, and for this reason this patient is excluded from the following analysis. Neurologic examination of 2 of the remaining 10 patients was normal. In 3 patients (30 per cent) there were only minimal observations, such as reflex changes, facial weakness (1 case) and/or Babinski or Chaddock's signs. The remaining 5 patients (50 per cent) presented more serious sequelae, hydrocephalus and bilateral pyramidal signs (3 cases), bilateral nerve deafness (1 case) and hemiparesis (1 case).

CORRELATION OF DEVELOPMENT WITH RESULTS

There was no instance of developmental retardation in the 18 patients classified in the group with good results. Ten of the 11 patients in the group with poor results showed a decided deficit in development. In the latter group is included 1 patient who presented an extreme behavior problem but who revealed no developmental retardation.

SUMMARY

An analysis of 44 cases of meningitis due to Hemophilus influenzae is presented, representing patients admitted to Louisville General Hospital and Children's Free Hospital, Louisville, from 1945 through 1948. The majority of the patients (66 per cent) were admitted during the months of November through February; 40 of the 44 patients (91 per cent) were 36 months of age or younger, while 19 patients (43 per cent) were 9 months old or less.

There were 10 deaths in the series (22.7 per cent). The fatality rate among patients under 9 months of age was 42.1 per cent and that in patients above this age only 8 per cent. Of the 34 surviving patients, 29 were available for reexamination. Results in these were classified as either "poor" or "good." The group with poor results included patients manifesting a retarded developmental level and/or a definite neurologic deficit; the group with good results, included patients demonstrating no developmental retardation and no, or minimal, neurologic sequelae. Eleven patients were classified in the group with poor results and 18 (46 per cent) patients in the group with good results.

Analysis of the group of fatalities and the group with poor results, separately or combined, reveals a seizure incidence during the course of the illness of 71 per cent. Of this group, 2 patients have continued to have seizures and 2 others probably have psychomotor epilepsy. The incidence in the group with good results was 18.7 per cent, and none of these patients had further seizures as of the time of writing.

Electroencephalographic examination was done on 21 patients, 12 of whom were in the group with good results and 9 in the group with poor results; fourteen of the electroencephalograms were abnormal. Of the twelve in the group with good results, seven (55 per cent) were abnormal, with four of these showing focal abnormalities; of the nine in the group with poor results, seven (77.9 per cent) were abnormal, with two showing focal abnormalities.

Neurologic examination revealed that 8 patients in the group in which there were good results (44 per cent) and only 2 patients in the group with poor results (20 per cent) had no sequelae. There was no developmental retardation in the group with good results, while 10 of the 11 patients in the group with poor results did show retardation.

In this analysis no significant correlation could be found between duration of illness, therapy, initial variation of the sugar level in the cerebrospinal fluid and the result.

CONCLUSIONS

1. There were good results in approximately 50 per cent of the cases in this series of influenzal meningitis.

2. The prognosis for patients 9 months of age or less is grave.

3. Approximately 43 per cent of patients examined had minimal neurologic changes; 21 per cent had major neurologic changes.

4. Because of the high correlation of seizures and mortality and morbidity, it would appear that more vigorous treatment of seizures, as well as chemotherapy and the administration of antibiotic agents, is indicated.

Cancer of the Breast.—Both oestrogens and androgens are used in breast cancer in women. In cancer of the breast in males oestrogens are of benefit and androgens are not; and in both men and women castration plays a part in the treatment of metastasis. The importance of hormones in the treatment of cancer of the breast lies in their effect on the terminal stages of disease. In early stages radical surgery is the method of choice; in more advanced cases in which the disease is still localized to the breast and its immediate lymph-drainage area the methods of choice are surgery and radiation. But hormones, both androgens and oestrogens, have given us a new weapon to control skeletal and visceral metastases.—Sir Stanford Cade, Chemotherapy in the Treatment of Malignant Disease, *British Medical Journal*, Nov. 26, 1949.

OCULAR CONTUSIONS IN NATIONAL EMERGENCIES

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EDITORIAL NOTE.—*This paper, together with the paper by Drs. Marshall and Callahan, which follow it, concludes the Symposium on Ocular Injuries. The papers of Drs. Cogan, Stone and Grant were published last week.*

In the event of a national emergency contusions of the eye, as in times past, will be one of the major causes of ocular disability. Such injuries may appear insignificant on first inspection, but major complications may develop within a few days or a few weeks. In many cases the full effects may not be known for years afterward.

Contusions of the eye are nonperforating wounds caused by blows or explosions in which the fibrous tunic, the cornea and the sclera, remains intact. It is difficult to distinguish such injuries as those caused by blows and those caused by explosions. In the Battle of Britain, however, it was observed that explosive contusions involved the anterior segment of the globe in many cases. Blows from blunt objects affected both the anterior and posterior segments of the eye, but frequently the posterior section showed major changes. Observations made in England during World War II confirmed similar observations in other parts of the world during that period.

IMPORTANT OCULAR CHANGES IN CONTUSION

Edema and Hemorrhages.—An accurate estimation of the condition of an eye which has undergone contusion is frequently impossible on first examination. The dependent and loose structure of the eyelids permits almost instantaneous swelling to such an extent that the globe is hidden from view and offers considerable difficulty for proper examination. The edema of the eyelids may be further complicated by extensive hemorrhages extending into the conjunctiva, and in explosions the presence of imbedded fragments and debris may complicate the condition. Severe pain and photophobia add to the difficulty of examination, and unless the physician is equipped with adequate anesthetics and proper instruments, the patient's wounds should be cleansed, first aid administered and the eye bandaged. After a few days' rest and on the removal of the bandage, a more extensive examination may reveal the true state of the eye. The effects of the contusion may have disappeared entirely during the period of rest.

Anatomic Review.—Since contusions of the globe tend to alter the arrangement of various structures it is necessary to review briefly some anatomic points with reference to such injuries. The eye consists of an almost avascular fibrous tunic, a millimeter or less in thickness, enclosing the uvea and transparent contents of the globe. This fibrous envelope, composed of transparent cornea, opaque sclera and weak meshlike lamina cribrosa suffers changes from the impact of blows or explosions. The sclera suffers only slightly, whereas the cornea and lamina cribrosa may have irreversible changes. Edema of the corneal epithelium with abrasions is a common observation, and in some cases in

Read in a Symposium on Ocular Injuries before the Section on Ophthalmology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1949.

which the impact is severe wrinkling of Descemet's membrane may persist until normal intraocular tension is regained.

The Limbal Region.—The junction of the cornea with the sclera, or limbus, is the thinnest portion of the fibrous tunic anteriorly; it experiences considerable strain and sometimes ruptures from severe contusions. The limbus is a concentric segment measuring 0.75 mm. anteroposteriorly at the junction of the cornea and sclera, and containing characteristics of each. The fibrous tunic is reduced in thickness in this area by the indentation of the scleral sulcus externally and the scleral furrow internally. The external sulcus is filled with fine loose areolar connective tissue permeated by blood vessels which end in small capillary loops at the corneal margin. The surface is covered with thickened stratified squamous epithelium, which is arranged in folds and undergoing transition to bulbar conjunctival epithelium. The scleral furrow, or the internal depression of the limbus, is filled with a meridional meshwork of endothelial-covered strands known as the ligamentum pectinatum. Schlemm's canal is in close relation to the outer bounds of the furrow. Anterior ciliary veins connect with the drainage channels which transport aqueous from the anterior chamber.

The effect of blows or blasts in the limbal region may exhibit edema and ecchymosis in the loose bulbar conjunctiva with decided ciliary injection. Because of the sudden impact and change in intraocular pressure, a rupture of the ligamentum pectinatum may occur with a reversal of aqueous flow and hemorrhage into the anterior chamber.

The sclera proper, which is composed of dense opaque connective tissue, is least involved of all ocular structures in contusion injuries.

The Lamina Cribrosa.—The most vulnerable and the weakest portion of the fibrous tunic is the lamina cribrosa, which is a weblike continuation of scleral fibers intermingled with glial components. Normal horizontal sections through the optic nerve show that there is a continuity in curvature of the cribriform plate corresponding to that of the sclera. In practically every contusion, whether from a tennis ball, blow or explosion, the lamina cribrosa is injured and pushed backward causing edema and sometimes hemorrhage into the optic nerve and retina. If the intraocular pressure rises above normal, the weakened lamina cribrosa gradually gives away and aids in the destruction of nerve fibers as they enter the scleral canal.

In addition to injuries to the globe proper, it is possible to have retrobulbar hemorrhages which may cause a protrusion of the eye and further complicate the management of the condition.

Damage to the Interior of the Eye.—Damage to the interior of the eye by contusions may include iridodialysis, rupture of the sphincter pupillae, separation of the ciliary muscle from the scleral spur, rupture of the suspensory ligament with dislocation of the lens, cataract formation, vitreous hemorrhage, rupture of the choroid, subchoroidal hemorrhage, detachment of the retina, commotio retinae and retinal hemorrhages.

The force exerted by sudden impact, whether positive or negative in pressure effect, causes increased strain on the thin root of the iris, frequently producing rupture or iridodialysis. The eye is flattened by the blow, and the aqueous exerts so much force in the periphery that the pupil is dilated to such an extent that the sphincter muscle may be ruptured. As a general rule, only one of the aforementioned injuries occurs in the same eye. If iridodialysis has occurred it is advisable to examine the region with the slit lamp microscope to be sure that vitreous will not complicate operative repair at a later date. Hemorrhage usually complicates such an injury by rupture of vessels connected with the arterial circles of the iris. If the sphincter of the iris is ruptured the pupil becomes dilated and may not react to light or accommodation. The condition remains permanent but may be helped with the use of pilocarpine.

Separation of the ciliary muscle from the anterior scleral spur is one of the most serious injuries resulting from nonperforating wounds. Usually branches of the ciliary arteries are involved and massive hemorrhage into the anterior chamber occurs. As the hyphema is absorbed, the depth of the anterior chamber is greatly increased and the iris is practically hidden from view by its recession. Further examination will show derangement and rupture of the ligamentum pectinatum. One of the frequent complications of this injury is the separation of the pigment layers of the ciliary body and iris with hemorrhage into the vitreous.

Subluxation of the Lens.—Rupture of the suspensory ligament may cause complete or partial dislocation of the lens due to sudden pressure of the iris. If the dislocation is partial, the lens may press the iris forward on the side of the dislocation with a consequent deepening of the anterior chamber on the opposite side. If the iris angle is sufficiently blocked, glaucoma will develop and surgical intervention becomes mandatory. A tremulous iris indicates ectopia lentis. If the lens is completely dislocated, it may appear in the anterior chamber followed by glaucoma or fall back into the vitreous. In either case, the fate of the eye is doubtful. Successful extraction of the lens after an anterior subluxation is hazardous even in the hands of experienced surgeons. The final result is often unsatisfactory. If the lens falls backward into the vitreous, the patient is placed face down in an effort to shift it into the anterior chamber. If the lens falls into the anterior chamber extraction may be attempted after transfixion or constriction of the pupil with miotics. The lens is removed by loupe extraction, and usually loss of vitreous occurs with other unpleasant complications.

A mild contusion may flatten the cornea and exert sudden pressure on the iris, causing the formation of a ring of pigmented substance on the anterior capsule of the lens. Whether the pigment is derived from the pigment epithelium of the iris or blood is debatable. The ring, which is somewhat smaller than the pupil, is best seen with the slit lamp microscope and usually disappears without treatment wtihin a few months.

Cataract.—Severe contusions may exert so much force on the suspensory ligament that a tear is produced in the region of the equator of the lens. Aqueous enters the substance of the lens, and cataract develops rapidly. Occasionally, the capsule is ruptured in the region of the posterior pole and the opacity develops more slowly. The enlargement of the lens from the invasion of its substance by aqueous causes the iris to bulge forward and to prevent the escape of aqueous into the drainage channels, thus causing glaucoma. It is obvious that the cataract should be removed before glaucoma develops. In young persons a linear extraction may be performed, but in older persons the conventional operation is used because the entire nucleus should be removed through a larger incision.

Vitreous Hemorrhages.—Vitreous hemorrhages may follow contusions of the globe in which considerable injury occurs to the flat part of the ciliary body. This region is vascular and offers a natural approach for blood to permeate the base of the vitreous into its substance. The recovery from a hemorrhage in the vitreous is exceedingly slow, and frequently cyclitic bands of fibrous tissue cause shrinkage and atrophy of the globe. Strands of organized fibrous tissue may extend backward to cause retinal detachment or retinitis proliferans. The absorption of vitreous hemorrhages seems to vary with the age and condition of the person. If the patient is young and healthy the hemorrhage may disappear without complications or loss of vision.

Rupture of the Choroid.—A sudden flattening of the globe from a contusion may cause a rupture of the lamina vitrea of the choroid as well as the pigment epithelium internal to it. The vascular layers of the choroid are involved, and considerable hemorrhage obscures the lesion on ophthalmoscopic examination. After the hemorrhage is absorbed one or more vertical striae between the macula and the optic disk may be seen. These grayish lines represent tears in the lamina vitrea and pigment layers, and indicate that the choriocapillaris has been destroyed in that area and that the rods and cones are functionless. In addition to simple rupture of the choroid it is possible, and often happens, that a massive hemorrhage will separate the choroid from the sclera, causing eventual loss of the eye.

Other Effects of Global Contusion.—Commotio retinae, or edema of the macula, may follow contusions of the globe. Ophthalmoscopic examination shows that the fovea is elevated and that the macular area appears to be grayish and swollen. Such a lesion is caused by the embarrassment of circulation from the underlying choriocapillaris and may disappear within a few days. If the condition persists and the circulation continues to be embarrassed, particles of pigment from the pigment epithelium invade the elements of the retina and the vision is permanently diminished. Blows on the cornea may produce edema around the macula and optic nerve, giving a bright red appearance to the fovea. If this condition persists, which it usually does, a "hole in the maculalutea" is produced with complete loss of central vision.

Detachment of the Retina.—Retinal detachment is one of the usual complications of contusions of the globe. The detachment is often in the periphery and difficult to repair with satisfaction. In many instances the detachment is complicated by hemorrhages, both on the internal and the external surfaces. Separation of the retina near the ora serrata gives a characteristic reddish reflex surrounded by a grayish undulated membrane. The red area corresponds to uncovered choroidal vessels. Diathermy operations are indicated in cases of this kind, but the results are not as good as one might hope.

Injury to Optic Nerve.—Sudden pressure on the globe may cause stretching of the optic nerve with rupture of one of the central vessels and the lamina cribrosa. If a vessel is ruptured the nerve is hidden by massive hemorrhage into the vitreous. If the blood absorbs, it is possible that a mound of grayish tissue will be formed on the surface of the disk producing atrophic changes and loss of vision. If the lamina cribrosa is ruptured, the nerve fibers lose their support in the retina, and in the stalk of the nerve they become atrophic leaving a whitish cast to the nerve.

Summary of Important Changes.—Following is a summary of the important changes which occur in contusions of the eye:

1. Edema and ecchymoses in the eyelids
2. Hemorrhages in the conjunctiva
3. Edema and erosions of the corneal epithelium
4. Wrinkling and rupture of Descemet's membrane
5. Edema and hemorrhage in the limbus corneae
6. Hyphema
7. Iridodialysis and radiating lacerations of the iris
8. Rupture of the sphincter pupillae and inversion of the iris
9. Traumatic iridocyclitis
10. Paralysis and spasm of accommodation
11. Subluxation of the lens
12. Cataract
13. Hypotony and hypertony
14. Vitreous hemorrhage
15. Rupture of choroid and choroidal hemorrhages
16. Commotio retinae, retinal hemorrhages and pigmentation
17. Detachment of the retina
18. Rupture of the lamina cribrosa and injury to the optic nerve

THERAPEUTIC MANAGEMENT

The management of contusions of the eye calls for little action and considerable patience on the part of the ophthalmologist. It is surprising how many contusions will heal without complication following simple cleansing, bandaging and rest. It is not necessary and often dangerous to administer atropine solutions following nonperforating injuries. Cool compresses are valuable, and the patient should have the benefit of sedatives or mild narcotics.

An estimation of the visual acuity should be attempted before the examination is made. This may be impractical due to swelling of the eyelids, pain, lacrimation and photophobia. The pain should be relieved by the instillation of 0.5 per cent tetracaine hydrochloride solution several times at three minute intervals. After the acute pain is relieved the vision should be recorded again and the anterior segment examined with a good light and a magnifying lens. The presence of conjunctival hemorrhages and irregularities of the corneal surface should be noted. Fluorescein sodium solution 2 per cent should be irrigated from the conjunctival sac to demonstrate erosions of the corneal epithelium. Wrinkling of Descemet's membrane with hyphema may be the next observation. The pupil may be dilated and fixed or constricted and spastic. The depth of the anterior chamber may vary, and the iris may be tremulous. Further examination with the slit lamp microscope may show corneal changes with numerous floating cells in the aqueous, many of them red blood cells. The tremulous iris may be more evident, indicating subluxation of the lens. Cataract formation may not show on this early observation.

The ophthalmoscopic view may show vitreous or retinal hemorrhages, commotio retinae, detachment of the retina or rupture of the choroid.

Intraocular foreign bodies should be suspected in all cases of blast injury, and the roentgen ray should be used to determine their presence.

The actual treatment of contusions depends on the extent of the injury and the parts affected. If the injury is mild and only anterior uveitis is present, cool compresses, guarded use of weak mydriatics and dark glasses may suffice. Analgesics should be prescribed, and reading should be prohibited.

If the injury is severe the patient should be hospitalized or confined to bed until the true condition is known. Some ophthalmologists advocate the use of

foreign protein to combat the effects of histamine in severe contusions. If a hyphema tends to form a hard clot and resist absorption it may be necessary to remove it surgically. If the lens is dislocated or forms a cataract an extraction is indicated. An extensive iridodialysis should be corrected, and a detached retina should be replaced by diathermy.

If a national emergency comes, it is necessary that ophthalmologists review the experience gained in recent critical years and use it to preserve the vision that might be lost by unintelligent management of ocular contusions.

LACERATIONS AND PERFORATIONS OF THE LIDS AND GLOBE

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Perforating wounds and lacerations of the lids and globe will be considered in this article. Repair of old injuries will be excluded, as well as foreign bodies and injuries due to contusion, although these related subjects overlap in part. In the wartime bombing of civilians about 0.75 per cent of wounded persons had damage to their eyes or visual apparatus, of which 80 per cent was caused by flying debris. In civilian life nearly a quarter of the ocular lacerations are caused by particles of glass. As against war wounds, domestic injuries are less violent, more likely to involve only the eyes and more often one eye than both.

DIAGNOSIS

Diagnosis and evaluation of the extent of the ocular injury are essential to proper treatment. Diagnosis may be made before first aid is given and must precede plans for definitive therapy. Presence of other bodily injuries may make the ocular lesions secondary, nevertheless careful ocular examination should be completed at the earliest opportunity. Sometimes it can be made satisfactorily only with the patient under general anesthesia. Local anesthesia and van Lint palpebral akinesia aid the thoroughness and safety of this first examination. Severity and extent of the damage often are much greater than the external wound or appearance would indicate.

Lids.—The extent and location of lid wounds must be estimated or determined, and in mesial wounds, whether either canaliculus is severed. The levator palpebrae superioris may be torn. If the globe is intact, the lids should be everted to locate tears in the conjunctiva.

Orbit.—Inspection, palpation and roentgen examination reveal fractures of the orbital walls. The margin may be irregular. Enophthalmos suggests herniation of orbital contents through the orbital wall, usually downward. Proptosis may result from the forcing of bone fragments into the retrobulbar space or from orbital hemorrhage. Emphysema indicates fracture into a nasal sinus, even when roentgenograms reveal apparently normal conditions, and the patient must be warned not to blow his nose. Fracture at the apex or hemorrhage into the sheath may compress the optic nerve or damage the motor nerves. Late appearance of ecchymosis in the lids or of subconjunctival hemorrhage may indicate fracture of the orbit. Vision should be checked as accurately as possible. Deeply penetrating wounds should be probed with caution, if at all, for they may extend beyond the orbit to the frontal or temporal lobes of the brain. An orbital injury above the zygoma should be considered as a potential cerebral injury until proved otherwise. Possibility of retained foreign bodies and dirt should be constantly considered.

Globe.—The conjunctiva, cornea and sclera of the globe must be inspected. In less obvious injuries, fluorescein stain and a slit lamp examination are invaluable in finding sites of injury or entrance. If the globe has been perforated, commonly intraocular tension is down. However, small wounds seal quickly, and intraocular hemorrhage or a swollen cataractous lens may elevate intraocular tension. Traumatic cataract and anterior iritic adhesions may follow a small wound as frequently as a large one. Any intraocular structure, especially the uvea and vitreous, may be prolapsed into or through the wound. One must realize the possibility of a hidden posterior perforation of the globe by rupture or by a missile or wound the entrance of which may be through the lid or at an unrecognized site. Occasionally the ophthalmoscope reveals a hole in the iris or a track of blood through the vitreous. Abnormalities in the depth of the anterior chamber; variations in size, shape and position of the pupil; changes in position and transparency of the lens; cells in the aqueous, and blood in anterior or vitreous chambers—all bespeak serious damage to the globe but do not necessarily enable one to differentiate between injuries due to contusion, perforation and foreign bodies.

FIRST AID

Emergency action is demanded to protect the exposed cornea from drying and from added trauma. This can be done temporarily by dropping saline solution, boric acid solution or water on it; better by using liquid petrolatum or white ointment, or sterile petrolatum or petrolatum-treated gauze, and best by replacing the lids over the globe and holding them by a dressing or by a temporary suture.

Ocular therapy aims at cleanliness and asepsis rather than the strenuous use of antiseptics. To avoid further hemorrhage and prolapse the patient should remain at complete rest on a litter with both eyes closed or bandaged. Fear of blindness must be allayed. If only the lids are lacerated, or the conjunctiva, the patient may be ambulatory.

Dirt or foreign material easy to pick out should be removed, and the wounds and cul-de-sac cautiously irrigated with sterile, warm solution, as saline. If needed for the comfort of the patient, instil anesthetic drops and then 1 per cent atropine drops for mydriasis. Occasionally induction of facial akinesia is indicated to relax extreme blepharospasm that would promote greater prolapse. An antiseptic solution, such as penicillin 1,000 units per cubic centimeter, or 30 per cent sulfacetimide, may be instilled into the eye. Penicillin and tetanus antitoxin should be given intramuscularly, and analgesics provided for pain. Sulfadiazine, 6 Gm. daily for a few days, with the dose then reduced to 4 Gm. may be used as prophylaxis. Gross flaps of lacerated skin or lid may be sutured into position temporarily. If the globe is uninjured, a firm dressing should be applied; otherwise, a light dressing without pressure. In the latter case it is desirable that a protective, rigid shield be placed over the dressing to protect the eye against accidental blows. This shield may be made of aluminum, cardboard or other stiff material. Shock

Read in a Symposium on Ocular Injuries before the Section on Ophthalmology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1949.

must be treated, and other injuries not neglected. It usually is not necessary to operate on the eye immediately if delay for twenty-four hours will improve the patient's general condition. The patient should be moved as quickly as is reasonably possible to a hospital where expert ophthalmic care is available for definitive surgical treatment.

PROGNOSIS: SYMPATHETIC OPHTHALMIA

Decision on the handling of an injured eye may first require choice between an attempt to conserve the eyeball or its removal. In the extreme case, either minor or severe, this choice is easy. There is a broad zone between, in which the decision demands the best of clinical judgment, and consultation is valuable. On certain general principles there is wide agreement, but each case must be decided for itself. There is some urgency, because if the eye is to be removed, it should be done within ten days of the injury if sympathetic ophthalmia is surely to be avoided, and that dread condition has been reported to have occurred even sooner. Treatment depends on many factors, but in the absence of a foreign body and of infection, they may be listed as: the location and extent of the wound; the degree of remaining and anticipated vision; amount of intraocular hemorrhage; condition of the lens; and the degree of prolapse or loss of ocular contents.

Presence of one or more of the following conditions is usually indication for removal of the eye:

1. Extensive laceration with prolapse and loss of tissue.
2. Blindness in an eye severely injured, or in one that is painful.
3. Persistent inflammation or irritableness.
4. Severe injury in the zone of the ciliary body.
5. Purulent endophthalmitis or panophthalmitis.

Presence of the following conditions adds weight to a decision to enucleate:

1. Expectation that useful vision will not be preserved.
2. Extrusion of the lens.
3. Severe vitreous hemorrhage.
4. Continued hypotension, atrophy and pain.
5. Delay after trauma in proper surgical repair. .
6. Cataract.
7. Prolapse of uvea.
8. Normal opposite eye.
9. Retracted scar.

Many authorities believe that conservative surgical management demands a readiness to remove a severely injured eye rather than to run any serious risk of sympathetic ophthalmia in the other. One must never forget that any perforating injury, or incision or rupture, can produce sympathetic ophthalmia. Sixty-three per cent of that disease is due to penetrating wounds of the globe. Overoptimism of the surgeon may mean a serious risk to the future vision of the patient.

There is another aspect to consideration of this difficult problem. Prompt and capable surgical intervention will save most eyes. Removal of an eye may safely be delayed ten days. Repeatedly an eye damaged beyond hope makes an unbelievable recovery. Many eyes with good vision can be saved even though there is prolapse of the ciliary body or choroid. Sympathetic ophthalmia is a rare disease, occurring after penetrating injuries in about 1.5 per cent of cases. It was extremely rare in World Wars I and II. Like a tornado, it is difficult to know where it will strike, for an eye with extensive injuries may be saved, while a child may suffer lifelong blindness from a small puncture wound promptly treated, as a result of this disease.

Every injured globe deserves careful study to see if there is a faint chance of saving it, with vision. Surgical intervention should be performed promptly, and both eyes should then be followed carefully, with slit lamp examination. During the first week the visual prognosis and the outlook for the eye must be repeatedly reevaluated. Occasionally laboratory procedures, such as following an increase in mononuclear white blood cells or determining sensitivity to uveal pigment, may be of assistance toward a decision, but the decision to enucleate or not rests in the final analysis on the clinical judgment of the physician. The problem is most difficult, unless one ruthlessly performs enucleation whenever in doubt. If the globe is shattered or macerated, great care and patience are demanded to insure finding and removing every bit of uveal tissue.

TREATMENT OF LID WOUNDS

Repair of lid wounds should be painstaking. The necessity of plastic procedures at a later date to correct deformities is much reduced if proper care is given as soon as possible after the injury. The proper repair of lid wounds demands attention to the fibers of the orbicularis oculi, reattachment of a torn levator, careful approximation of the lid margin and reestablishment of lacrimal drainage. Horizontal lacerations of the lid usually heal well, but vertical ones, cutting across the orbicularis and margin, gape and become deformed. An excellent study of the care of fresh lid wounds has been published in detail by Minsky.

The vascular supply to the tissues of the lids and orbital area is so great that little débridement is indicated, and only the most hopelessly devitalized tissue need be excised. Every bit possible should be saved. Irregular and beveled flap edges should not be straightened, for they give more surface for healing. Foreign material should be washed or picked out, but radical probing for small inert foreign bodies lost in the orbit or even in the lids is not usually necessary. They can be sought later if they cause symptoms. The wound should be flushed with saline solution, and the skin sutured with fine silk, usually with interrupted stitches. Clips should not be used. Skin and muscle are considered as one layer, tarsus-conjunctiva as another. In closing a wound these two layers should overlap, utilizing the principle either of a tongue and groove, or at least of an overlapping skin flap as in the Wheeler halving operation. One should not suture too tightly, but allow for edema. If deeper tissues, such as orbicularis muscle, are severed and gape they can be united with a few 6-0 surgical gut sutures. A drain is seldom required.

In marginal lacerations of the lid the cut goes through the lid. The main problem is to secure healing without notch and deformity. A canthotomy at the external canthus will relieve tension on the suture line. Avoiding a notch requires an intramarginal suture that can well be placed first, though not tied until later. It should be of fairly fine silk, placed in the gray intramarginal line 3 mm. each side of the cut and crossing the cut about 3 mm. from the margin accurately, so the two sides are united. If the levator of the upper lid is torn, it can now be repaired with buried surgical gut. The conjunctiva is next closed, starting at the fornix end, using interrupted stitches of fine silk or 6-0 surgical gut. Two or three sutures of surgical gut may be used to close the tarsus, and are buried, but the tarsal conjunctiva is not sutured as such. Skin and orbicularis are sutured as a separate layer in a line offset

from the tarsal closure. The intramarginal suture can be run into the opposite intact lid, by inserting each arm through the gray line and bringing it out beyond the cilia, to be tied together over rubber. Thus the good lid splints the lacerated one. An extra external suture should be placed near the ciliary line to close the fibers of Riolan's muscle. A pressure dressing is applied for a week, changed at five days for removal of silk sutures. To immobilize the lacerated lid, both eyes must be bandaged after operation. If a single laceration crosses to involve both lid margins at the same point, they may be splinted against each other with a figure-of-eight suture as advocated by Minsky.

Wounds at the mesial end of the lower lid are commonly avulsions and include severence of the lower canaliculus, as can be readily determined by irrigation through the punctum. The mesial end can be found by irrigating through the upper punctum. Overcorrection, if possible, is desirable for proper repair of such a laceration, for otherwise the lid tends to heal too far down and too far laterally to regain good function. A heavy, braided silk, double armed suture should be placed in the tarsus or palpebral ligament of the lateral flap, or lid, run through the stump of the palpebral ligament or through the periosteum above and behind the anterior lacrimal crest, without damaging the sac, and then out through the skin, to be tied over rubber. Heavy silk, surgical gut or a lacrimal probe should be threaded through the two halves of the lower canaliculus. The probe must be bent, cut and left in place. If a suture is used, it can be brought out through the sac and overlying skin. Skin and orbicularis are closed with interrupted silk stitches placed higher at the nasal end, to draw up the lateral flap. Probe and sutures are removed on the sixth day.

CONJUNCTIVAL WOUNDS

Lacerations of the conjunctiva should be sutured if they are large and gaping, after washing out any debris but without excising any tissue; they should be closed with running or interrupted fine silk or surgical gut. Many lacerations as long as ½ inch (1.27 cm.) will heal quickly without suture, even though gaping. When there is a wound of both palpebral and bulbar conjunctiva at adjoining points, repair by suture is a necessity to avoid adhesions. Before a conjunctival laceration is closed the underlying tissues or sclera should be exposed and carefully inspected to insure against overlooking a scleral wound or involvement of muscles.

CORNEA AND SCLERA

Wounds of the globe must be repaired before those of the lids. Repair of corneal lacerations offers three possibilities: no suture, a conjunctival covering flap and direct suture of the wound. If a corneal wound does not gape, if it is not large and if the edges are well approximated spontaneously, chances are good that it will heal without further surgical intervention, provided the patient is kept at rest with both eyes bandaged. Otherwise it is desirable to suture the cornea or draw an apron or bridge of conjunctiva over the cut. In the consideration of direct suture against conjunctival flap, each of the technics has the support of experienced advocates. Perhaps the two technics are of equal value. But flaps increase trauma and reaction, promote and collect discharge, may actually aid separation of the lips of the wound instead of approximating them and certainly obstruct or prevent proper observation of the wound postoperatively. Corneal suture is said to give less scar and astigmatism, earlier reformation of the anterior chamber with fewer anterior iritic synechias, and better observation. But to suture a gaping wound of the cornea or sclera is not usually easy. It requires cataract sutures and needles, and fine-toothed strong forceps or a Birch pick. Sutures should penetrate only the outer half of the corneal stroma, or the episclera. They must be placed without pressure on the soft globe and preferably should avoid the center of the cornea, where scar is most detrimental.

As in surgical intervention for cataract, one should utilize, during repair of lacerations of the globe, such aids as retrobulbar injection of procaine hydrochloride solution, palpebral akinesia, and bridle suture in a rectus muscle when indicated; the weight of the lids should be kept off the globe. Corneal wounds are frequently followed by undesirable scar and adhesions, the latter of which may be lessened by putting air into the anterior chamber at the conclusion of the operation. Although corneal lacerations are usually sharp, the lips soon swell and round off. Lightly cauterizing the lips of the wound with trichloroacetic acid may promote healing. This is done before tieing the sutures or before covering with a flap. Sutures holding conjunctival flaps should not be on the cornea. The line of conjunctival closure should not overlie the scleral or corneal wound.

Scleral wounds must be treated with diathermy points behind the ciliary body to avoid retinal detachment and must at least be covered with a conjunctival flap. As with the cornea, closure is better and stronger if the wound is sutured. It is easier to place sutures in episcleral tissue than in corneal tissue. Often one can more easily place sutures parallel with than crossing the laceration. Tieing across then gives excellent closure of the mattress type.

Two complications of lacerations of the globe are retained foreign bodies, to be considered at length by Dr. Callahan [1] but which must never be forgotten by the surgeon, and prolapse of intraocular tissue, usually uvea and vitreous but occasionally retina and lens. Prolapse of the lens is usually indication for enucleation. Prolapse of iris is common and not extremely serious. Prolapse of ciliary body or choroid is dangerous and exceedingly serious. From injury to final closure of the wound every effort must be made by patient and all attendants to avoid increasing the prolapse. Straining, vomiting and squeezing by the patient, or careless manipulation by any examiner or physician, may extend a minor prolapse into a devastating one, or cause severe hemorrhage. Before excising any prolapsed tissue, place all sutures and prepare the conjunctival flap, ready for quick closure of the wound. Occasionally, but seldom, is it safe to replace without excision a prolapsed clean and fresh portion of the iris. If iris prolapse is in the center of the cornea, it may be better to make a new incision with the keratome at the limbus for performing the iridectomy. Prolapse of uvea or vitreous should be cleanly resected, leaving no tissue in the lips of the wound. Almost never should a portion of the ciliary body or choroid be excised, even though prolapsed. Usually if excision is indicated the eye should be removed.

Types of conjunctival flaps are numerous. The most useful is the apron flap of van Lint, drawn over as much of the cornea as is desired, without tension, and held by two carefully placed silk sutures in the episcleral

1. Callahan, A.: Foreign Bodies of the Eye, J. A. M. A. (this issue, p. 249).

limbal tissue on each side. After tieing, a spatula should be passed between flap and cornea to insure that the wound edges are in proper position. In eight to ten days the sutures should be removed, unless they have spontaneously pulled free. The flap usually retracts in five days except when the wound is large or the lips have been cauterized with acid, in which case the flap may adhere. Bridge flaps are sometimes useful, but unless they are well sutured they are loose, ineffective and difficult to hold in place. A complete conjunctival purse-string flap, covering the whole cornea, has value in severe wounds but almost always as a first aid or temporary procedure. This type, advocated by the British early in World War II, especially has the disadvantage of hiding the globe completely until it is removed. It is therefore to be avoided, if possible, wherever the patient is due to leave the observation of the surgeon. Otherwise a succeeding surgeon, as in a wartime chain of evacuation, who does not have a clear conception of the injury that is covered, cannot determine the extent of injury by looking at the eye. Even the original surgeon cannot observe changes and complications. This same objection holds for other types of flap, but to a lesser degree. Any ocular muscle found lacerated in serious degree should be carefully reunited with 6-0 surgical gut.

ORBITAL FRACTURES

In orbital fractures isolated bits of bone may be removed, but most fractured pieces should be replaced by manipulation, hooks and probes, working if possible with a maxillofacial surgeon, as often the orbital fracture is only part of more extensive damage and displacement of maxilla, zygoma or frontal bone. Careful clinical studies, despite edema, and roentgenologic studies are necessary to recognize serious injuries that may cause enophthalmos and displacement of the globe, proptosis and damage to the optic nerve. Hemorrhage in the orbit may produce decided proptosis or an extremely tense and painful edema of all orbital tissues.

COMPLICATIONS

Management of complications following ocular wounds encompasses much of the entire field of ophthalmic surgery and is related as much to contusions and foreign bodies as to lacerations.

After hemorrhage into the anterior chamber the blood should be removed by paracentesis and irrigation if it hides nearly all the iris and if the intraocular tension remains over 35 mm. Schiötz longer than twenty-four hours. In this condition miotics instead of atropine reduce the likelihood of a second and more serious hemorrhage. The clot should be washed out early, both eyes closed by a bandage, and the patient put at complete bed rest for several days. Vitreous hemorrhage cannot be treated as well, since vitreous transplantation is still in the experimental stage.

Infection is no longer the frequent foe that it used to be. Good and prompt surgery, antibiotics and chemotherapy prevent most infections. Iritis, however, is almost inevitable, and is combated by careful surgical treatment, atropine, local heat and fever therapy.

Glaucoma complicating wounds is usually due to hemorrhage, swollen traumatic cataract or iritis. The cause must be treated, and in the meantime pressure must be controlled by paracentesis, repeated as often as necessary.

Traumatic cataract should be left alone until the eye is quiet, unless it is producing glaucoma or severe iritis, in which case linear extraction with thorough irrigation to remove cortex is indicated. Sometimes much lens cortex can be removed at the initial surgical repair, but commonly it will be found to be mixed with vitreous and must be left alone. Later secondary remains can be needled. Don't leave lens capsule in the wound. A lens luxated subconjunctivally or into the anterior chamber should be extracted, but in the vitreous it should be left alone unless it causes serious symptoms or glaucoma.

Retinal detachment can be an early or a late complication. Occurring with other changes for the worse, it might influence the decision for enucleation. If the eye is otherwise in fairly hopeful condition, or if the opposite eye is blind, diathermy operation should be done as soon as initial healing has progressed well for a week or more, depending on the individual case. Trauma causes retinal detachment in only 12 per cent of cases of detachment, or not as often as was thought. In general, detachment of the retina due to trauma is especially amenable to cure by diathermy operation.

FOREIGN BODIES OF THE EYE

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Small foreign bodies on the external surface of the eye, especially on the cornea, may escape notice unless a magnifying loupe is worn by the examiner and the illumination focused to a point with a strong convex lens. The use of these simple aids, or preferably the slit-lamp microscope, will allow detection of particles of extremely small size. Moreover, the focused beam of the slip-lamp parallelogram allows observation of the corneal depth which the foreign body has reached.

Location of Foreign Bodies in a Series of 192 Consecutive Industrial Patients

	Number	Percentage
1. Cornea	149	77
2. Conjunctiva	12	6
3. Upper cul-de-sac	19	9
4. Lower cul-de-sac	11	6
5. Intraocularly	2	1
	192	100

The cornea is by far the most frequent site of location of foreign bodies as shown in an analysis of a series of 192 consecutive cases from an industrial plant which were observed personally (fig. 1 and the accompanying table).

Foreign bodies are probably more frequent in the lower cul-de-sac than in the upper, but in the former location they may be removed by the lacrimal fluid or by the patient's own efforts. The upper cul-de-sac requires more scrutiny than does the lower, for it extends several millimeters above the tarsus in the upper lid, and simple eversion of the upper lid does not expose it. When a foreign body is suspected but remains undetected, one should evert the tarsus and then stretch the cul-de-sac forward and convexly with a Walker or Fox lid everter. The fold behind the

Read in a Symposium on Ocular Injuries before the Section on Ophthalmology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1949.

lacrimal caruncle is another recess which may conceal a foreign body.

Intraocular foreign bodies must always be suspected in blast injuries, or when the patient has been near the application of striking, grinding or cutting force applied to metal. A few cases of "uveitis" have been traced by Haik [1] to unrecognized intraocular foreign bodies.

EXAMINATION

When the presence of an extraocular or intraocular foreign body is possible, the following examination must be made:

1. The vision should be measured as soon as possible. This is of prognostic value whether the foreign body is corneal or intraocular in location.

A reduction of vision is the rule when a foreign body enters the eye, but it is by no means a unique experience to see a mildly inflamed eye with 20/20 vision in which a small steel foreign body has been present two or three weeks. Intraocular foreign bodies may cause little or no pain at the time of impact; frequently there is noted only a slight stinging sensation in the eye, accompanied sometimes by a "sick feeling" in the stomach. This is in considerable contrast to the patient who has a severe pain from a cinder in the cornea or from a superficial corneal abrasion.

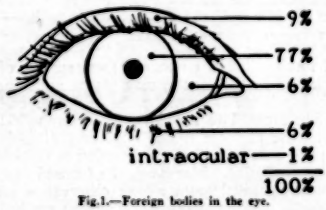


Fig. 1.—Foreign bodies in the eye.

Intraocular hemorrhages make the examination difficult and the prognosis uncertain. It is important to try to determine the extent and exact location of these hemorrhages. They may be from the retinal or uveal circulation and may occur in the anterior chamber, vitreous, retina or uveal tract. Hemorrhages into the anterior chamber should be evaluated if secondary glaucoma develops and continues, but in my experience this has been rare unless the lens is damaged also. Hemorrhages into the vitreous show variations in the rapidity and degree of their absorption and should be given ample opportunity for spontaneous improvement. Choroidal hemorrhages are usually extensive and quickly cause irrevocable damage to the overlying retina. Since the more anteriorly situated hemorrhages obscure deeper ones from the field of view, the examiner must rely on subjective examination to determine the extent and location of deeper hemorrhages. It is especially important to differentiate those in the vitreous from those in the subchoroidal space because of the differing prognoses. Differentiation often can be made by examination of the visual field with a point source light of low intensity.

Immediately after the injury there may be a loss of light perception and projection from intraocular hemorrhage; in some cases the blood is absorbed and within a few days the light projection returns; as an end result, some useful vision is saved. It is wrong to quickly remove an eye because a foreign body has penetrated it with resultant loss of the ability to see light. Also, the danger of sympathetic ophthalmia developing within ten days is so rare that proper and complete observation and first aid care of even the most severely injured eye should always be rendered. There is no urgency for immediate enucleation unless the eye has been pulped or so macerated that the structures are completely destroyed.

2. Instillation of fluorescein (2 per cent solution) followed by flushing with isotonic sodium chloride solution will reveal the presence of any denudation of the epithelium by a striking greenish stain.

3. Detailed study of the anterior segment of the eye should be made with slit lamp illumination and biomicroscopical magnification.

The majority of intraocular foreign bodies enter through the cornea, leaving a penetrating scar that can be located. There may be a hole in the iris, and with the pupil dilated the track of the foreign body through the lens may be found. If the foreign body enters through the sclera exposed in the palpebral fissure and the overlying conjunctiva heals rapidly, there may be no visble signs or symptoms. Diagnosis in such a case can be made only by roentgen examination.

Multiple foreign bodies of the cornea from powder burns should be left alone unless they cause inflammation. Many eyes exhibit powder and carbon grains which have been scattered in Bowman's membrane and in the stroma for years without inflammatory reaction or detectable visual impairment. If small fragments of glass are identified in the corneal stroma and are deeply embedded, and there is no ocular inflammation, it is better to leave them in situ.

4. The lens, vitreous, retina and choroid should be studied with the ophthalmoscope. The central and peripheral portions of these structures must be searched carefully. For visualization of the structures as near as possible to the ora serrata retinae, the patient is directed to turn his eye in each direction to bring these portions into view.

5. A roentgenogram should be made in every case in which there is the possibility of the presence of a foreign body.

IMMEDIATE TREATMENT

External Foreign Bodies.—Removal of foreign bodies from the cornea under direct slit lamp microscopic examination is becoming a standard method among ophthalmologists. An assistant holds both of the patient's lids apart and the head firmly against the forward chin support. The examiner's elbow rests on the table, or on a small box on the table, and a spud is held near the eye (fig. 2). The examiner locates the spud through the microscope and moves the point toward the foreign body, which is then removed. The instillation of a few drops of solution pontocaine hydrochloride (0.5 per cent) or cocaine hydrochloride (4 per cent) will produce anesthesia adequate for the removal of the foreign bodies. This use of the slit lamp microscope is particularly indicated for the removal of an oxidation ring caused by ferrous particles. The oxidation ring is in Bowman's membrane and the stroma and must be removed to prevent continued ocular inflammation. A small corneal burr is excellent for this.

Foreign bodies near the endothelium or projecting into the anterior chamber usually have entered the cornea obliquely. For proper care, hospitalization is

1. Haik, G. M.: Management of Intraocular Foreign Bodies in Military Practice, Am. J. Ophth. 29:815-827 (July) 1946.

necessary. The foreign body must be removed in the operating room with the observance of intraocular surgical aseptic technic. Gundersen [2] inserts a canaliculus knife or discission knife through the path of entry until the foreign body is reached, and the sharp edge of the blade is then used to cut directly forward. This gives exposure of the foreign body so that it may be removed with the discission knife or with a spud. Fox has described a method of cutting a small, partially penetrating flap of stroma directly over the foreign particle and folding it back to remove the foreign body, thus avoiding the danger of pushing it into the anterior chamber.

Intraocular Foreign Bodies.—If the presence of an intraocular foreign body is suspected, both eyes should be bandaged and the patient transported at once to the ophthalmologist for a complete ocular examination. This prevents motion of the eyes, which in the presence of a foreign body may induce further intraocular hemorrhage or provoke or assist in a detachment of the retina. This is much more important than putting the patient to bed.

The removal of an intraocular foreign body is not an immediate surgical emergency. Vision and the eye are much more likely to be saved if the eye is carefully studied, roentgenologic localization made and surgical attack carefully planned and executed. Tetanus antitoxin should be administered as soon as possible. The extensive use of sulfonamide compounds and antibiotics has shown conclusively that sepsis induced by intraocular foreign bodies can be reduced tremendously by the use of these agents. They should be administered immediately in all cases, and this treatment should continue four or five days until it is apparent that infection is not developing. The prognosis must be guarded early because of the danger of intraocular infection and late because of the possibility of retinal detachment and other complications. Infection may occur despite the successful extraction of the foreign body, since pathogens may have accompanied it. Administration of penicillin for (possible) gram-positive organisms, streptomycin for (possible) gram-negative organisms and sulfonamide drugs (for either or others) should be instituted without delay.

MANAGEMENT OF INTRAOCULAR FOREIGN BODIES

Accurate localization of intraocular foreign bodies should precede any surgical attack. Emphasis has been changed from a speedy extraction to accuracy of localization. Many methods have been presented, and the Sweet ball-indicator localizer and the Comberg-Pfeiffer contact lens method are in most common use. I have used the contact lens method with success, and I prefer it because the position of the foreign body on the film in relation to the markers can be visualized in both the posteroanterior and lateral plates. Localization by any method must be considered approximate because of the possiblity of slight head or eye movements, especially when there is faulty fixation.

To assist in localization there are special technics available for advanced problems. Vogt's bone-free dental film is used to determine the presence of a foreign body in the anterior segment of the eye when a foreign body is small and the bone shadows would be confusing. Gasteiger has injected air and Scheie has injected oxygen in Tenon's capsule, to form a contrast shadow in cases in which it is difficult to decide whether a foreign body is intraocular or extraocular. Struble and Croll [3] have described a method for precise localization which consists of (1) completing a routine localization; (2) surgical exposure of the sclera at the point of localization; (3) suturing a small lead bead to the sclera at this point, and (4) exposing a second film to determine the accuracy of the first localization by its relationship to the lead bead. This method allows the most precise localization, but additional time is required while the roentgenograms are being developed.

In the hospital with which I am associated Grant has suggested, in cases in which the foreign body is visible ophthalmoscopically, that during surgical intervention a Walker diathermy pin be placed through the sclera at the point of localization and then located ophthalmoscopically with reference to the location of the foreign body.

Surgery.—Removal Via the Anterior Route: Some ophthalmologists have long preferred to use a strong magnet to pull the foreign body around the edge of the lens, through the pupil and into the anterior chamber. The surgical technic of removal here is easier and the risk is less. However, in many cases the foreign body will not be attracted and in others it will be moved forcibly enough to injure the retina, choroid, zonules or lens capsule.

Fig. 2.—Removal of foreign bodies from the cornea under direct slit lamp examination.

Gundersen has indicated that this is the method of choice for foreign bodies which are free in the vitreous. Struble and Croll have measured experimentally the distances which small magnetic particles of particular size can travel, and they believe that removal of a foreign body from the vitreous by the anterior chamber route cannot be accomplished in a large percentage of cases.

Removal via the Posterior Route: The approach through the pars plana of the ciliary body was suggested by Verhoeff and further described by Barbour and Fralick. It is the safest point of entry into the posterior segment, for the pars planum is only several cells thick and relatively avascular; and the ora serrata, located

2. Gundersen, T.: Surgery of Intraocular Foreign Bodies, Tr. Am. Acad. Ophth. 51:604-613 (July) 1947.

3. Struble, G. C., and Croll, L. J.: Removal of Magnetic Foreign Bodies from Posterior Segment of Eye, Am. J. Ophth. 29:151-161 (Feb.) 1946.

7.5 to 8 mm. from the limbus, is firmly attached to the choroid. Use of this area lessens the possibility of postoperative retinal separation.

In addition to the usual surgical instruments for the removal of foreign bodies, three special electrical devices should always be employed.[4] The Berman locator is

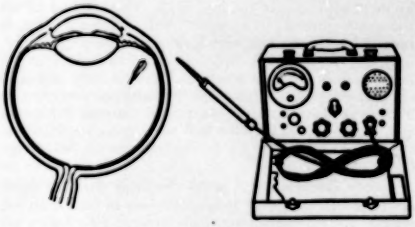


Fig. 3.—Foreign body localized with Berman locator.

useful during the operation in determining the position of the foreign body as the operation proceeds, particularly before the sclera is incised (fig. 3). The scleral opening is made with a Walker trephine equipped with a 2 mm. blade. The trephine blade is held carefully at right angles to the sclera and is placed in the meridian of the foreign body 5.5 to 6 mm. posterior to the limbus.

If the foreign body is in the anterior vitreous, the Lancaster hand magnet is usually strong enough to pull it through the opening. The long, thin tip is preferred because it is more powerful at short distances. If the foreign body is in the posterior vitreous, the use of the giant magnet with the thick blunt tip may be necessary (fig. 4). The foreign body must be removed

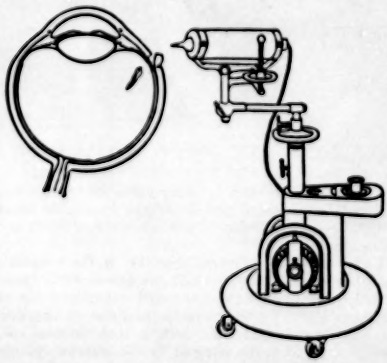


Fig. 4.—Foreign body removed with giant magnet.

with the least possible trauma to the eye itself, and it is therefore a good practice to use the weakest magnetic force which will remove a foreign body from the tissue in which it is lodged.

The third special device is then used; several areas of surface diathermy coagulations are made around the trephine opening with the ball electrode of Weve (fig. 5). This aids in preventing a retinal separation, and, if the entering wound of the foreign body is in the sclera, the diathermy electrode should be applied around it also.

4. Callahan, A.: Surgical Repair of Injuries of the Eye and Adnexa, Springfield, Ill., Charles C Thomas, Publisher, 1950.

NONMAGNETIC FOREIGN BODIES

The use of light-weight metals as aluminum and the development of new alloys, which have little or no magnetizability, in modern warfare and industry have increased greatly the difficulties of removal of foreign bodies from the eyes. Savin has noted that foreign bodies of low magnetizability may become crusted after several days' contact with ocular fluid with a white crumbly powder, probably a product of metal oxidation. These bodies may be so small that they can be seen only with the slit lamp microscope. Mielke placed aluminum in the eyes of rabbits, so that it remained ophthalmoscopically visible, and found that it could be tolerated for two years. I have seen 10 of 12 patients with metallic, but nonmagnetic, intraocular foreign bodies demonstrable ophthalmoscopically or roentgenologically, or both, who have retained (with correction) visual acuity of 20/30 or better for a year after the injury was sustained.

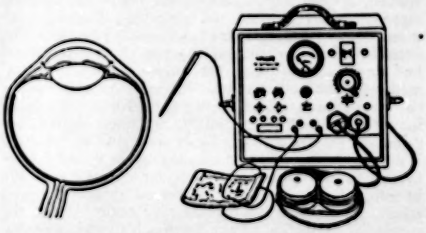


Fig. 5.—Attachment of retina with diathermic unit.

Eyelashes are the most common of the secondary foreign bodies. The presence or absence of irritating oils or fats on the shaft probably determine whether a cilium can be safely retained, and the reaction or lack of reaction of the eye will point to whether or not it must be removed. The removal of nonmagnetic foreign bodies is difficult and sometimes impossible. If the object can be seen with the ophthalmoscope, then an opening may be made through the sclera and Thorpe's special forceps used to grasp the foreign body under ophthalmoscopic observation. If the object is not visible, sometimes transillumination across the globe will cast a shadow in the sclera and make possible the removal. For foreign bodies in a clear vitreous but with a cloudy lens, the Thorpe endoscope is indicated.

PATHOLOGY

In a series of 731 eyes enucleated with foreign bodies, Wilder [5] found that 62 per cent of the objects were nonmagnetic, 37 per cent magnetic and 1 per cent mixed. These eyes were removed from a series of soldiers who sustained military injuries. Copper and brass were most numerous among the nonmagnetic metals. Nonmagnetic foreign bodies were found not only as primary missiles or in association with magnetic material but also as material retained after extraction

5. Wilder, H. C.: Intraocular Foreign Bodies in Soldiers, Tr. Am. Acad. Ophth. 52:585-593 (July) 1947.

of a magnetic missile or as implants along the path of a primary missile which had passed completely through the eye. In severe head injuries, skin and bone were sometimes implanted and behaved as inactive foreign bodies, unlike conjunctival epithelium, which finds the interior of the globe a fertile field for growth.

In eyes submitted for pathologic examination the magnetic foreign bodies are in the minority, in part because the eye does not come to the pathologist's attention if successful surgical intervention is performed. Even in eyes that are removed, nonmagnetic foreign bodies are often secondary to those metals which may have been extracted. Of 5 cases of sympathetic uveitis, Wilder reported a retained nonmagnetic foreign body in 4 and a retained ferrous foreign body in 1.

Abscesses were seen by Wilder around the sites of foreign bodies of various types, almost invariably around vegetable matter. In the vitreous chamber the subsequent formation of pyogenic membrane resulted in retinal detachment and phthisis bulbi. Sympathetic uveitis developed in 5 patients with retained intraocular foreign bodies, predominantly of the nonmagnetic variety.

908 S. 20th St.

ABSTRACT OF DISCUSSION

ON PAPERS BY DRS. STONE, GRANT, COGAN, PAYNE, MARSHALL AND CALLAHAN

DR. DERRICK VAIL, Chicago: (A summary.) The incidence of damage to the eyes increased with the condition of warfare, whether it was a static war, as in the Normandy Invasion, when the troops were held contained by the Germans for weeks, or in front of Metz, where the Third Army was held by a group of highly trained enemy artillery for months. Land mines are exceedingly vicious as far as ocular injuries are concerned. In addition, the figure that was established in World War I, that about two and a half soldiers would be blind for every thousand killed, has held in World War II. My impression is that roughly 1,500 soldiers and sailors were totally blind in this war. Ocular injuries play a large part in not only the actual damage to physical structure of the body but the incapacity of the person who is affected. Under the stress of warfare this fact is frequently forgotten because of the multiplicity, extent and severity of body wounds elsewhere. Consequently, the ophthalmologist and his function in war are often relegated to a rather minor position. I wish to emphasize that point, because it is highly significant that the Surgeon General requested this symposium from that point of view. Dr. Grant discussed chemical injuries, chiefly burns. In the old days, and perhaps nowadays the ophthalmologist tried to discover some chemical substance to neutralize the chemical. For an acid burn, he would like to use something like sodium perborate; for an alkali burn, he would prefer the use of acetic acid. I strongly protest the use of a neutralizing solution in the treatment of chemical burns. The thing that has proved to be of utmost value is ordinary tap water, any kind of water. Copious and perhaps excessive irrigation with a gentle stream of water is more effective than any attempt to neutralize the chemical itself. Dr. Grant also emphasized the delayed effect of these chemicals. Every ophthalmologist has at times been deceived by the apparent clarity of the cornea at the time of the injury, whereas in twenty-four or forty-eight hours the cornea may be entirely and irreversibly opaque. In chemical burns, early and frequent parencentesis is important, because the chemical has penetrated through the cornea and is now in the aqueous; and when it gets into the aqueous, damage is being done to the endothelium and to the stroma but more seriously to the intraocular contents. Dr. Cogan gave a summary of what might be called the spectrum of electromagnetic radiation and the various parts of the spectrum which produce certain characteristic lesions. The subject of the neutron type of cataract is one that has come to the fore in the last few months. In a number of physicists working with the cyclotron and atomic pile there have developed lens opacities which are the direct result of neutron exposure. There is, as far as I am able to determine, no difference in the appearance of the radiation cataract produced by neutrons and that produced by roentgen rays. All ophthalmologists have seen damage to the lens as a result of therapeutic use of roentgen rays in acne of the face. I do not believe that the dermatologists are using that form of therapy to as great an extent. But the fact that neutrons are capable of producing lens opacities no different in appearance from those seen as a result of roentgen ray exposure would indicate that they are the effect of the rays on the epithelial cells at the periphery of the lens, the embryonic cells that continue to develop lens fibers throughout life. Dr. Payne discussed the effect of contusions on the eye. The study of the eye from an anatomic point of view, with particular reference to its weak parts, will enable one to build up the entire picture of ocular contusions, based on the effect of the contusion on these weak parts, bearing in mind how seldom it is that only one part of the eye is affected in contusion. Dr. Marshall gave a study of penetrating wounds, perforating wounds and lacerations involving the lids and the eyeball. It was not unusual in the last war for eyes to be removed by the general surgeon in the front line, in evacuation hospitals and even in the battalion area because of a contused or penetrated or injured eye that probably might have been saved had the surgeon been aware that, although sympathetic ophthalmia is a real danger, there is a definite time of safety and during that time every effort should be made by the general surgeon or by the frontline battalion surgeon to make sure that the patient is sent to an area where definitive treatment can be performed and the patient properly taken care of by an expert ophthalmologic surgeon. Dr. Callahan discussed the diagnosis and described the damage done when a flying piece of metal or a sharp instrument penetrates the eye. In closing this symposium I should like to summarize what all of the speakers have said. Any eye that is damaged requires a careful study to determine the extent of the damage and to make a proper diagnosis. I could cite many instances in the last war in which a ward surgeon had his attention directed to the fractured femur, or the fractured arm, or chest injuries and neglected to examine the wounded eyes, with the result that in some cases penetrating and perforating wounds with intraocular foreign bodies were missed for as long as a week or ten days before the patient was well enough to mention to the ward surgeon that his eyes had been affected by the injury. Again, it was not unusual for those who worked in the general hospitals in the rear and communication zones to encounter eyes where intraocular foreign bodies had persisted for two or three weeks without a diagnosis having been made. In a few instances an untrained field surgeon attempted to remove what he thought was a foreign body in the cornea but which turned out to be a prolapsed iris. Those mistakes are not unusual, and I want to have them in the record because the Surgeon General will use this material in future directives to his field surgeons, battalion surgeons, general surgeons and evacuation hospital surgeons.

The second point to be summarized, besides the examination of the patient, is the matter of first aid by the unskilled. I am certain that a number of eyes were lost in the last war and in civilian life among patients with a seriously injured eye, a rupture or a penetrating wound, with vitreous extruding through the lips of the wound or with lens or iris prolapse through a corneal wound, that could have been saved if the person who saw the patient first would have had in mind the possibility of such a condition. It would be a simple matter to instil in the minds of general practitioners and those who are giving emergency treatment for injuries the principle that any wound of the eye should be considered potentially serious and that the patient should be protected against his own movements during transmission from the place where he was injured to the hospital or to the eye surgeon, where proper care of the eye can be given. It was a rule in the European Theater that

any combat soldier or civilian who had an ocular injury had to be evacuated as a litter case. Unfortunately, this directive was not carried out to any great extent. But that is the ideal. In other words, both eyes should be bandaged and the patient transported to the nearest ophthalmic station or surgeon as a litter case.

The third important point is infection and hemorrhage, our two chief enemies. Infection is no longer the problem that it used to be, but intraocular hemorrhage is still exceedingly serious and deserves more study than has been devoted to it. For that reason, the Committee on Ophthalmology of the National Research Council has recommended to the Medical Director of the Veterans' Administration that a research study of considerable magnitude be instituted to determine what can be done about hemorrhage: first, to avoid it; second to hasten its absorption, and third, to prevent the sequellae that may be serious; for example, that of glaucoma, which is almost always present in a seriously damaged eye, sooner or later. And the glaucoma is of a curious type. There may be an early rise in tension followed by a period when the eye comes back to normal and then a secondary rise, which may be impossible to control.

I wish to express gratitude to the Surgeon General for permitting a discussion on this subject, and I hope that what has been said in the symposium will be of value to him and to colleagues in other military forces.

QUESTIONS AND ANSWERS

QUESTION: Both in and out of the Navy, I have seen a few serious perforations of the globe in the ciliary body region with prolapse of the ciliary body. In these instances I have excised the herniating tissue and sutured the sclera. An uneventful recovery was made with useful to good vision in all. There was no evidence of sympathetic ophthalmia even eight years later in 2 patients. Dr. Verhoeff has reported a similar case. Have you had a similar experience?

DR. DON MARSHALL, Kalamazoo, Mich.: My experience with serious wounds of the ciliary region is not extensive. Successful repair of a ciliary body which had been lacerated has been reported. Dr. Snell of Rochester has made the flat statement that not all eyes with prolapse of the ciliary body need be enucleated and that recovery is possible. This case of Dr. Knapp's adds to the group in which repair of a lacerated ciliary body has succeeded with perfect or satisfactory results. His case proves the point that one never can be sure. Most ophthalmologists agree, although perhaps prejudiced by previous teaching, that injuries of the ciliary region and injuries in which there is prolapse of uveal tissues are especially dangerous because of the possibility of sympathetic ophthalmia and must be handled with that more severe prognosis in mind. But there are cases in which repair can be made without the development of sympathetic ophthalmia and a satisfactory result obtained.

QUESTION: What effect has atomic bombing on eyes?

DR. DAVID G. COGAN, Boston: With the explosion of atomic bombs, there is a whole gamut of radiation all the way from the short wave gamma rays up to the longer roentgen rays. In addition there are beta rays and neutrons. There is not any public information on the distribution of those radiations as a function of distance. Theoretically, the effect of beta rays would be negligible, because they do not penetrate through air sufficiently, even in the high potentials with which they started out. The chief effects from the atomic bomb would be expected from the gamma rays and from the neutrons. The dosage of gamma rays that produces damage to the eyes is of the order of 1,000 r and if one had available the amount of radiation that was present at various distances from that particular atomic bomb, presumably one could tell whether a person was getting a cataractogenic dose or not. As far as I know, such information has not been made public. The same applies to neutrons. Neutrons penetrate like gamma rays and could presumably cause cataracts if they reach a person in sufficient dosage. Of course, the dosage follows the inverse square law and becomes decidedly reduced as the distance away from the explosion increases. The recent development of neutron cataracts in cyclotron workers has aroused considerable interest and has stimulated study of late effects of atomic bombs. These cyclotron workers have been exposed for a considerable period, and only now are the cataracts developing. It is possible that other cataracts have had their origin in the neutrons of the atomic bomb and may become evident now or later. I was invited with two other colleagues to go to Japan this summer to make a survey of the possibility of incidence of cataracts. No large series has been studied to date. There has been some indication that cataracts occurred soon after the atomic bomb explosion, but there was no possibility of dissociating concussion cataracts from radiation cataracts at that time. Radiation cataracts presumably would only now become apparent. Regarding susceptibility to neutron cataracts, there is evidence that the cumulative effect of neutrons is much greater on the eye than on the skin or other tissue because the repair process of the lens is so much slower than that of other tissue; it may be that neutron cataracts are particularly going to be evident in those subjected to chronic exposure rather than in persons who received one acute exposure at the time of the atomic bomb explosion.

QUESTION: Please discuss injuries due to broken fluorescent bulbs.

DR. ALSTON CALLAHAN, Birmingham, Ala.: I have had no experience with pieces of fluorescent bulbs which have penetrated or lacerated the eyeball.

QUESTION: What about ointments in emergency care of corneal injuries? Several cases of ointment in the anterior chamber and on the iris have been seen.

DR. ALSTON CALLAHAN, Birmingham, Ala.: Recent reports point out the real danger that ointment may get into the anterior chamber in a penetrating corneal wound. It is becoming the routine practice to use a solution such as sodium sulfacetimide (38 per cent) in industrial injuries. I personally do not use ointments in such cases.

QUESTION: In treatment for intraocular foreign bodies, what strength subconjunctival injection of penicillin is used?

DR. ALSTON CALLAHAN, Birmingham, Ala.: Injections of 1,000 units of penicillin per cubic centimeter of solution have been used without complications. Probably this strength can be safely increased. The use of antibiotics with iontophoresis promises better results than subconjunctival injections alone.

QUESTION: Does iontophoresis with penicillin help to raise the intraocular penicillin level sufficiently to aid in combating intraocular infection, when present?

DR. ALSTON CALLAHAN, Birmingham, Ala.: Yes. It has been shown that the intramuscular injection of penicillin is of little value against vitreal infections. It must be used locally to be of value, and when local use is combined with iontophoresis, the penicillin level in the vitreous will be raised greatly.

QUESTION: Given hyphemia from injury, of large amount, with no increase in tension, should one use mydriatics or miotics?

DR. BRITTAIN F. PAYNE, New York: If there is considerable hemorrhage in the anterior chamber and no increase in tension, the use of a mild mydriatic is not contraindicated and, with sufficient rest, may be beneficial. However, with the first sign of increased intraocular tension mydriatics should be deleted from the treatment and a weak solution of pilocarpine ordered. Each case is different. If there is considerable ciliary injection in a soft eye, it may be a good plan to use a mild mydriatic to raise the tension to normal and control uveitis.

QUESTION: Does the use of a sulfhydryl solution such as hydrosulphosol have a useful biochemical basis in the treatment of chemical burns of the eye?

DR. W. MORTON GRANT, Boston: That question cannot be answered on a scientific basis as yet. There has been no adequate controlled investigation that I know of on the benefit of a medicine like the proprietary sulfhydryl solution. Since information is not available, a scientific evaluation cannot be made as yet. I know of no theoretically sound basis on which to expect any favorable effect.

QUESTION: Should one bandage eyes from which foreign bodies in the cornea have been removed and instil a mydriatic?

DR. ALSTON CALLAHAN, Birmingham, Ala.: Eyes from which corneal foreign bodies have been removed are bandaged. Mydriatics are instilled, particularly homatropine hydrobromide, if a ciliary flush is present, if the foreign body has penetrated deeply into the stroma, or if there is evidence that traumatic iritis will develop.

QUESTION: What method should one use for the removal of intraocular nonmagnetic foreign bodies?

DR. ALSTON CALLAHAN, Birmingham, Ala.: Dr. Thorpe has outlined three methods: 1. When the vitreous and lens are transparent, the foreign body is kept under ophthalmoscopic observation as special forceps are introduced through a small scleral opening to grasp it. 2. When the nonmagnetic foreign body is very near the sclera, a strong and powerful small point of light may be used from the opposite side to cast a shadow on the sclera. An incision is made in the sclera at the shadow, and the eye is opened. The strong point source of light is kept on, and the foreign body, which is seen as a black object in a light background, can be removed. 3. For foreign bodies in eyes with a cloudy lens but with yet clear vitreous, the Thorpe ocular endoscope is indicated. It seems that many believe that the end of this instrument must be introduced inside of the eye. Such is not the case. The instrument is placed against the hyaloid membrane, and only the forceps pass into the vitreous. Unfortunately there are many cases in which intraocular nonmagnetic foreign bodies resist these methods.

QUESTION: What are the indications for and against the use of atropine when hyphemia is present in a nacute injury?

DR. DERRICK VAIL, Chicago: If one considers the work that has been done in the past on the absorption of hyphemia one gets some clue as to treatment. It has been shown by a number of authors that hyphemia is absorbed by two routes: (1) through the canal of Schlemm and particularly (2) through the stroma of the iris and into the blood vessels of the iris. It is assumed that by using a miotic early in the stages of hyphemia there is a possibility of hastening the absorption of blood and preventing the development of secondary glaucoma. By contraction of the iris, the stroma is exposed to a greater extent and the angle of the anterior chamber, especially if narrow, is open. It has been the policy at Cook County Hospital to use routinely a weak solution of pilocarpine, either 0.5 or 1 per cent solution, immediately on finding hyphemia, whether it is due to contusion or penetration or follows cataract surgery. Then a study of the patient is made to determine whether or not secondary glaucoma or iritis is developing. Iritis is not an early manifestation in noninfected penetrating wounds of the eye. If it occurs at all, it is the result of the protein corpuscular breakdown or from the injured lens material. If this is correct, mydriatics should not be used. If this is a direct contradiction to what others believe, I am sorry. Mydriatics are not to be used unless there is a definite indication. In that case I would prefer to use phenylephrine hydrochloride (neosynephrine hydrochloride®) and to treat the case as one would any form of iritis.

QUESTION: Is it necessary to do a paracentesis in acid burns?

DR. DERRICK VAIL, Chicago: In any chemical burn of the cornea, whether acid or alkali, a paracentesis of the anterior chamber early is beneficial. By reducing the intraocular pressure through a paracentesis, the stroma cells and the layers of the stroma are allowed to approximate and produce a thicker or more resistant sheet of tissue between the outside and the inside of the eye, and the secondary aqueous has a higher protein and antibiotic content than has the primary aqueous. An objection to the use of paracentesis is that it subjects an eye that is already badly injured to further trauma. I do not think that objection is valid when one considers the benefit that may occur.

QUESTION: If one attempts to remove a tiny piece of brass in deep layers of corneal stroma, almost in the central area, which cannot be roentgenographically visualized but can be seen by slit lamp examination, will not vision be reduced? Is it advisable to permit the piece of brass to remain in the cornea?

DR. DERRICK VAIL, Chicago: There are two factors here. First, what type of brass has one to deal with? Is it brass with a high or low copper content? Second, one must know whether or not the piece is difficult to remove, whether it is best to leave it alone and, provided it is left alone, whether or not it will produce damage. Considering the last part first, I believe that any foreign body should be removed if possible. In the multiple type, it depends on the toxicity of the material. Experience during the war showed that there was little toxicity to these bodies. If one is dealing with a single foreign body in the cornea, regardless of its nature every effort should be made to remove it. There is no foreign body that cannot be removed from the cornea if an earnest attempt is made to do so. If it were a piece of brass of high copper content, I believe that it would produce serious damage to the cornea and should not be left.

QUESTION: What about the use of atropine in a soft eye?

DR. DERRICK VAIL, Chicago: If one agrees with the work that has been done in the past on the absorption of blood in the anterior chamber, one contracts the pupil to present a greater surface of the iris for absorption. If one believes that a soft eye is an indication of iritis, then mydriatics are to be used. Pilocarpine is used not to prevent glaucoma but to hasten the absorption of material. Its secondary effect of preventing glaucoma is important. Pilocarpine is the least irritating of all miotics and acts directly on the nerve fibers of the iris.

QUESTION: To what extent is early graft of buccal mucous membrane in places where bulbar conjunctiva near the limbus has become necrotic because of a chemical burn (Denig's operation) being used with good results in this country?

DR. DERRICK VAIL, Chicago: I am not in a position to answer the question for my colleagues throughout the country. I can say that at Cook County Hospital it is used freely, especially in the type of burn that is due to lye. An interesting case of this type occurred on Dr. Puntenney's service. A woman had lye thrown in both eyes. Her left eye was completely destroyed. Her right eye showed a necrotic burn of the conjunctiva and the lower half of the cornea. It was impossible to replace the conjunctiva, and a Denig's graft did not take. The sclera was rapidly becoming necrotic, and the eye was in serious danger of perforation. After débridement of the necrotic conjunctiva of the lower lid and the sclera, Dr. Puntenney sutured the lower lid to what was left of the sclera. Adhesions formed properly, and the lid became an integral part of the eye. We have warned her not to let an exuberant surgeon free the symblepharon. If he does, he is going to do an intraocular operation.

DR. I. S. TASSMAN, Philadelphia: A point that I would like to bring to the attention of the group and Dr. Marshall in particular, in order to obtain his reaction, concerns cases of laceration of the cornea in which the wound might be penetrating. In order to avoid a conjunctival flap, or in a case in which a flap is not necessary, I have employed a drop of autogenous plasma plus 2 or 3 drops of a preparation of thrombin in the wound in order to provide and obtain an immediate fixation of the wound in the cornea and thereby promote healing. In some of these cases the anterior chamber will be reformed in thirty minutes. It requires little time to prepare. Five to ten cubic centimeters of blood can be withdrawn under aseptic conditions in a syringe from the patient that has been previously heparinized and the plasma obtained in about fifteen minutes by centrifuging. Dropping this on the wound and adding 2 or 3 drops of thrombin solution provides an almost immediate closure of the wound and will promote and accelerate healing. The eye should be permitted to remain open for two or three minutes before the lids are closed, and then the ordinary dressing is applied in the usual manner. I want to ask whether Dr. Marshall has any knowledge or experience with this procedure in any ocular conditions during the war. I know that it was used in some cases of skin grafting about the lids, but my question is with regard to injuries of the globe.

DR. DON MARSHALL, Kalamazoo, Mich.: I have not had personal experience with this method of taking care of corneal wounds. Dr. Vail tells me that Dr. Newell of the 108th Hospital in England during the war was not satisfied that it was appreciably better than others. On the other hand, the principle involved appeals to me, and it seems to me that, if with further experimental work it was found to be satisfactory and helpful, it might give great promise for the future.

DR. J. S. SHIPMAN, Philadelphia: I have always been taught, and have always tried to teach, that intraocular foreign bodies represent an emergency. The point that Dr. Callahan wanted to make, and I agree with him, is that it is not so much a matter of an emergency that the foreign body should be tampered with and removed by means of a magnet before one knows where it is. A great deal of damage can be done if one goes at it blindly. The point on which I should like to disagree with Dr. Callahan is the inadvisability of anterior route for the extraction of foreign bodies. I think this is the safest and one of the best ways to remove a foreign body of the proper size. The answer to the whole discussion is the size of the foreign body and the length of time that it has been in the eye. If the foreign body is 3 mm. or less in size, the safest way to remove it is by the anterior route, particularly if the foreign body has been in for any length of time and the wound has already closed over. Of course, if the wound is still fresh the foreign body can be removed through this. To remove a foreign body by the anterior route one must have the proper equipment, which, of course, includes a giant magnet. This cannot be done with a hand magnet. The patient should be seated in the proper position with the tip of the giant magnet directed toward the center of the cornea, the operator controlling the magnet and his assistant holding the patient's head. The current which supplies the magnet should be turned on and off by the nurse, who is at the command of the operator. With the current on, the patient's head is held far enough away so that the tip of the magnet is about 6 inches (76 cm.) from the center of the cornea. The patient's head is then brought closer to the tip of the magnet by the assistant, with the current kept on, and if no definite pull is noted the tip of the magnet is brought up to the center of the cornea. If there is still no pull, the current is turned off and on with the hope of dislodging the foreign body and bringing it forward around the periphery of the lens. Care should always be taken to watch for a bulge in the iris, which indicates that the foreign body has come forward around the lens. As soon as any bulging is noted, the current is turned off and the remainder of the extraction is done under sterile precautions. Paracentesis of the anterior chamber is done, and the foreign body is then extracted by means of the hand magnet. However, this procedure requires considerable manipulation, and sometimes patience, to complete it successfully. Many physicians seem to feel that a foreign body extracted by the anterior route will go through, or at least damage, the crystalline lens; but it has been our experience that this does not happen in foreign bodies of the size mentioned. I should like to ask Dr. Callahan if the size of the foreign body should not regulate the method of approach for its removal.

DR. ALSTON CALLAHAN, Birmingham, Ala.: In stating that the removal of a foreign body is not an emergency, I mean that the patient is not to be rushed to the operating room and the magnet applied immediately. He should have a detailed clinical study and an exact localization from dry roentgenograms. If there is any question of the accuracy of the localization, it should be repeated. Patients with intraocular foreign bodies received at our hospital late in the afternoon are not operated on until the next morning, though tetanus antitoxin and the administration of antibiotics are begun immediately. The patient should not be brought to the operating room until there is available, besides the usual surgical instruments, the magnet, the Berman locator and the diathermy apparatus for retinal reattachment. The question of anterior versus posterior removal will always have adherents on each side; I have not been successful in removing foreign bodies 1 mm. or less in size from the posterior vitreous via the anterior route. Foreign bodies greater than 1 mm. in size may damage the zonules, lens or ciliary body if removed via the anterior route.

Clinical Notes, Suggestions and New Instruments

TREATMENT OF ACUTE GOUTY ARTHRITIS WITH PITUITARY ADRENOCORTICOTROPIC HORMONE (ACTH)

H. M. MARGOLIS, M.D.
and
PAUL S. CAPLAN, M.D.
Pittsburgh

This report describes the striking beneficial results of therapy in 2 cases of acute gouty arthritis treated with single injections of pituitary adrenocorticotropic hormone (ACTH).

REPORT OF CASES

CASE 1.—N. Y., a white man aged 59, sought treatment June 8, 1945 because of recurring attacks of severe gouty arthritis of sixteen years' duration. The attacks, which had involved at various times the metatarsophalangeal joints of the big toes, the knees, wrists, elbows and ankles, would last several weeks to a month, subsiding completely without interval symptoms or permanent swelling or deformity of the joints. At the time of the initial examination the patient was having an attack of acute gouty arthritis characterized by inflammatory changes about the left ankle and the metatarsophalangeal joint of the left great toe. The diagnosis was confirmed by the elevated plasma uric acid of 8.12 mg. per hundred cubic centimeters and the characteristic roentgenographic changes in the feet typical of tophaceous gout. The sedimentation rate was accelerated to 22 mm. in thirty minutes and 26 mm. in sixty minutes (Cutler method). Results of examination of the blood, urinalysis, Mosenthal concentration test and the electrocardiogram were within normal range. The acute attack was treated with colchicine and a purine-free diet, and it cleared up.

The patient was then placed on a regimen consisting of a low purine diet and maintenance doses of colchicine 1/100 grain (0.6 mg.) three times daily, four days of the week, and sodium salicylate 20 grains (1.29 Gm.) three times daily, three days of each week. Despite this he continued to have recurring attacks of acute gouty arthritis involving one or many joints, the achilles tendon and the ligamentous structure of the dorsal spine, occurring one to six months apart. The attacks became characterized by their longer duration and more gradual subsidence, leaving residual capsular thickening of the metacarpophalangeal joints of the hands. The sedimentation rate was accelerated in the interval between acute episodes, suggesting an associated rheumatoid arthritis. Two subsequent plasma uric acid determinations when the patient was receiving treatment were 5.2 mg. and 5.9 mg., per hundred cubic centimeters.

About Aug. 1, 1949 the patient had his severest attack of acute gouty arthritis involving the left hand and wrist; it progressed within several weeks to involvement of both hands, wrists, elbows and shoulders, the neck, dorsal spine and feet. The pain was violent, and the patient was completely disabled. Administration of colchicine to the point of toxicity, sodium salicylate 15 grains (0.97 Gm.) four times a day and neocinchophen 15 grains four times a day relieved the symptoms only partially; the pain could be controlled only with large doses of meperidine hydrochloride (demerol® hydrochloride) and codeine. The attack continued unremittingly, and the patient was admitted to St. Margaret Memorial Hospital Sept. 17, 1949 in a state of complete disablement.

Laboratory studies revealed a fasting blood uric acid concentration of 6 mg. per hundred cubic centimeters. The blood sedimentation rate was 28 mm. in thirty minutes and 29 mm. in sixty minutes (Cutler method). The blood count, results of urinalysis and blood nonprotein nitrogen determinations were

The pituitary adrenocorticotropic hormone (ACTH) used in this study was supplied by Dr. John R. Mote of the Armour Laboratories, Chicago.

From the Departments of Medicine, School of Medicine, University of Pittsburgh, St. Margaret Memorial and Montefiore hospitals, and the John C. Oliver Memorial Research Foundation of St. Margaret Memorial Hospital.

within normal limits. The patient could not raise his arms to feed himself, and he could not clench his fists.

On September 18 at 11:40 a. m. 50 mg. of pituitary adrenocorticotropic hormone (Armour standard) was administered intramuscularly. By 12:55 p. m. (one hour and fifteen minutes after injection of the drug) the patient had practically recovered from the acute gouty attack. He was able to move his hands, elbows and shoulders without any discomfort; he was able to feed himself, and he had no pain in the neck, back or feet. The tenderness of the joints had disappeared. He was asymptomatic for the first time in forty-nine days.

The blood uric determinations after the drug was injected were: one hour, 6.5 mg.; three hours, 6.5 mg.; six hours, 5.75 mg., and twenty-four hours, 6.25 mg., per hundred cubic centimeters.

A low purine diet and maintenance doses of colchicine and sodium salicylate were continued, and, except for minor nondisabling joint symptoms related to the chronic rheumatoid arthritic changes, the patient has remained comfortable and active.

CASE 2.—M. S., a white man aged 59, had had his first attack of acute gouty arthritis affecting one large toe joint and ankle nine years previously. Thereafter he had had six typical attacks of acute gouty arthritis of varying degrees of severity, involving a foot, ankle and knee and, on one occasion, the quadriceps tendon. On May 30, 1949 an acute synovitis of the left knee with hydrops appeared, subsiding in three to four days. On June 10 an acute attack of gouty arthritis involving the metatarsophalangeal joint of the right great toe developed. Although the joint was swollen, painful and red, the patient managed to be up. Despite the patient's observance of a low purine diet and a regimen of colchicine 1/100 grain (8.6 mg.) three times daily, three days of each week, and sodium salicylate 10 grains (0.65 Gm.) three times a day the other four days of each week, the symptoms progressed to increased severity. On July 11 the arthritis extended to involve the dorsum and lateral aspect of the right foot in addition to the large toe. The pain became so severe that the patient was unable to bear his weight on the affected foot and was admitted to St. Margaret Memorial Hospital on July 12. During the week prior to admission the patient took colchicine to the point of toxicity and neocinchophen in a dosage of 7½ grains (0.5 Gm.) three times daily without benefit. Laboratory studies revealed a plasma uric acid value of 6.5 mg. per hundred cubic centimeters. The blood nonprotein nitrogen determination, blood cell count and result of urinalysis were within normal limits. The blood sedimentation rate was 10 mm. in thirty minutes and 15 mm. in sixty minutes (Cutler method). Roentgen examination of the feet and knees revealed normal conditions. On July 16 at 9:30 a. m. 50 mg. of pituitary adrenocorticotropic hormone was administered intramuscularly. Within one hour there was complete disappearance of inflammation and pain, and the patient was able to walk and bear weight with comfort. Only slight puffiness and mild residual stiffness remained for about a week. On a maintenance regimen of a low purine diet, colchicine and salicylates the patient has remained entirely asymptomatic.

COMMENT

The effect of administration of pituitary adrenocorticotropic hormone in these 2 cases of acute gouty arthritis was dramatic. Both patients had acute gouty arthritis of over one month's duration, unrelieved by accepted measures of treatment. The first patient had been invalided for seven weeks and had suffered violent pain for four weeks. The second patient had been in pain for five weeks and was completely invalided for one week prior to the administration of pituitary adrenocorticotropic hormone. In the two instances recovery from the acute gouty episode occurred within one hour and within one hour and fifteen minutes.

The excretion of large quantities of urates as a result of an increase in the renal clearance of uric acid is one of the effects of the 11, 17-oxysteroids, Kendall's compounds E (17-hydroxy-11-dehydrocorticosterone, cortisone) and F (17-dehydrocorticosterone). A similar increase in urate excretion is generally induced by the administration of pituitary adrenocorticotropic hormone to patients in whom the adrenal cortex is intact.[1] However, the improvement in gout induced by pituitary adrenocorticotropic hormone is probably not related to increased excretion of uric acid. The administration of salicylates may induce uric acid excretion as great as that produced by the aforementioned drug,[2] but in most instances there is hardly a comparable clinical recession of the acute gouty episode.

The mechanism of action of the adrenocortical preparation in gout is as yet unknown. It has been suggested that there is a decrease of adrenocortical activity immediately preceding the acute gouty attack.[3] Wolfson and others[4] have also suggested that this relative deficiency of 11, 17-oxysteroid (cortisone) secretion may be associated with an increased production of abnormal adrenal steroids. Thus, one may postulate either an increased demand for 11, 17-oxysteroids or a decreased supply of pituitary adrenocorticotropic hormone in gout, a possible deficiency which may be corrected by the administration of the endocrine preparation.

Unlike the therapeutic problem in rheumatoid arthritis, in which long-continued administration of cortisone or pituitary adrenocorticotropic hormone is required, the acute gouty episode in our 2 cases was terminated by a single dose of 50 mg. of the latter. This fact is of considerable practical importance, because the possible dangers from undesirable side effects of long-continued administration of the agent are absent. We therefore have reason to believe that gout is one disease in which pituitary adrenocorticotropic hormone may terminate the acute, disabling episode.

It has been demonstrated that immediately after administration of the drug there is stimulation of adrenal cortical function with excretion of urates and subsidence of the clinical manifestations. Shortly afterward, however, (generally within thirty-six hours) a decided rebound of gouty symptoms may develop. By the administration of colchicine or salicylates, or both together, immediately after discontinuance of treatment with pituitary adrenocorticotropic hormone, the rebound of acute gouty arthritic manifestations may be prevented.[4] This was actually the case in both instances reported herein. It is, of course, obvious that such termination of the acute attack of gouty arthritis with the adrenocorticotropic substance may be without effect on the subsequent course of the disease and that later acute episodes of gouty arthritis are not necessarily averted. However, this does not detract from the value of the therapeutic resource which the drug provides for the termination of the acute gouty arthritic episode.

CONCLUSION

Two cases of gout are reported in which prompt and dramatic resolution of the acute episode of gouty arthritis was induced by a single injection of pituitary adrenocorticotropic hormone.

The possible significance and practical value of this form of therapy is discussed.

ADDENDUM

Since this report was submitted a third patient with gouty arthritis was treated with pituitary adrenocorticotropic hormone (ACTH).

CASE 3.—A man aged 41 had always been in excellent health except for recurrent attacks of typical acute gouty arthritis since 1938. Acute exacerbations occurred every four to six months, lasting three days to three weeks. The last acute attack developed Nov. 10, 1949, with typical inflammatory changes and severe pain in the right great toe, the right knee and ankle and the left wrist. On December 23 (about six weeks after onset) he still had severe pain, swelling and redness of the affected joints, although the discomfort had subsided sufficiently to per-

1. Thorn, G. W.; Bayles, T. B.; Wassell, B. F.; Forsham, P. H.; Hill, S. R.; Smith, S., and Warren, J. E.: Studies on the Relation of Pituitary-Adrenal Function to Rheumatic Disease, New England J. Med. 241:529, 1949.

2. Talbot, J. H.: Gout, reprinted from Oxford Loose Leaf Medicine, New York, Oxford University Press, 1943, pp. 79-134.

3. Wolfson, W. Q.; Cohn, C.; Levine, R.; Rosenberg, E. F., and Hunt, H. D.: Liver Function and Serum Protein Structure in Gout, Ann. Int. Med. 44:598, 1949.

4. Wolfson, W. Q.; Levine, R.; Rosenberg, E. F.; Hunt, H. D., and Guterman, H. S.: Adrenocortical Dysfunction in Gout, presented before the Seventh International Congress on Rheumatic Diseases, New York, June 1949, to be published.

mit him to get about with the aid of a cane. The evening of December 23 he was given 50 mg. of pituitary adrenocorticotropic hormone. Six hours later there was moderate improvement. He was then given an additional 25 mg. of the drug. The following morning (fifteen hours later) there was only slight residual soreness in the right knee and left wrist. Colchicine was then administered, and within the next twenty-four hours all manifestations of the acute attack, except for slight stiffness in the right knee, had disappeared.

423 Jenkins Building (22).

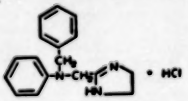
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

OFFICE OF THE SECRETARY.

ANTAZOLINE HYDROCHLORIDE.—Antistine Hydrochloride (CIBA).—2-(N-Phenyl-N-benzylaminomethyl) imidazoline hydrochloride.—$C_{17}H_{19}N_3.HCl$.—M.W. 301.81.—The structural formula for antazoline hydrochloride may be represented as follows:



Actions and Uses.—Antazoline hydrochloride has the general action of the other antihistaminic compounds. Given orally its effect compares favorably with the effects of tripelennamine and diphenhydramine. Approximately 20 per cent of patients exhibit some side effects, the most common of which are nausea and drowsiness.

Antazoline hydrochloride, like other antihistaminic compounds, applied topically to the nasal mucous membranes or to the eye, has some local effect on nasal and ocular allergy. There is rarely immediate relief from topical application of solutions of the drug, since there is no active constriction of the blood vessels; such immediate relief as may occasionally be observed is probably due to slight local anesthetic activity.

Antazoline hydrochloride has particular virtues in that it is milder than other antihistaminic drugs and less irritating to tissues. It should be remembered, however, that none of the antihistaminic compounds can take the place of vasoconstrictors, such as epinephrine and ephedrine, applied locally.

Dosage.—Orally, as tablets, 100 mg. four times daily. If adequate response is obtained, the dosage may be reduced to 100 mg. twice daily.

For ocular or nasal application, a 0.5 per cent solution in isotonic sodium chloride may be instilled in the eye or nose or administered intranasally by a suitable nebulizer every three to four hours. The frequency of administration should be governed by response.

Tests and Standards.—

Physical Properties: Antazoline hydrochloride forms white, odorless crystals with a bitter taste. It melts with decomposition between 232 and 238 C. It is sparingly soluble in water and alcohol, and practically insoluble in ether and benzene. A 1 per cent solution has a *p*H between 5.6 and 6.6.

Identity Tests: Dissolve about 0.2 Gm. of antazoline hydrochloride in 20 ml. of water. To 5 ml. of the solution slowly add 5 ml. of picric acid T.S.; a yellow precipitate is obtained which melts (*Caution!*) between 155 and 159 C. To a second 5 ml. portion of the solution add sufficient 5 per cent sodium hydroxide to make the solution distinctly alkaline; the white precipitate of the organic base melts between 114 and 118 C. To a third portion of the solution add 1 ml. of diluted nitric acid and 2 ml. of silver nitrate T.S.; a white precipitate develops which is soluble in ammonia T.S. (presence of halides). To a fourth 5 ml. portion of the solution add 10 drops of nitric acid; a red color develops which turns dark green on standing.

Purity Tests: Dry about 1 Gm. of antazoline hydrochloride, accurately weighed, for 4 hours at 105 C. The loss in weight is not more than 0.5 per cent.

Char about 1 Gm. of antazoline hydrochloride, accurately weighed, over a low flame. Cool, then add 1 ml. of sulfuric acid and continue ignition until no carbon remains; the residue is not more than 0.2 per cent.

Assay: Transfer 0.2 Gm. of antazoline hydrochloride, accurately weighed, to a 150 ml. beaker. Add about 25 ml. of water and 1 or 2 drops of sulfuric acid. Add slowly, with vigorous stirring, 75 ml. of a saturated solution of picric acid. Allow the mixture to stand overnight, and, after breaking up any lumps, transfer the precipitate to a tared sintered glass crucible, using the filtrate to effect complete transfer. Wash the precipitate with about 10 ml. of picric acid solution and then with two 2 ml. portions of ether. Dry to constant weight (about 4 hours) in a vacuum desiccator over phosphorus pentoxide. Each Gm. of the picrate is equivalent to 0.6104 Gm. of antazoline hydrochloride. The amount of antazoline hydrochloride present is not less than 97 nor more than 103 per cent.

Transfer 0.1 Gm. of antazoline hydrochloride, accurately weighed, to a 1,000 ml. volumetric flask and fill to the mark with water. Mix thoroughly and transfer exactly 10 ml. of this solution to a 100 ml. volumetric flask and fill to volume with water. The final solution exhibits an ultraviolet absorption maximum at 2,420 A with an extinction coefficient E (1%, 1 cm.), of 520 ± 5.

ANTAZOLINE HYDROCHLORIDE TABLETS:

Identity Tests: Crush 5 tablets and extract the antazoline hydrochloride with warm methanol. Filter the extract, evaporate the methanol and to the residue apply the identity tests listed in the monograph for Antazoline Hydrochloride.

Assay: Crush about 10 tablets and transfer a quantity of powder equivalent to about 0.2 Gm. of antazoline hydrochloride to a Soxhlet extractor and extract the powder for 1 hour with methanol. Quantitatively transfer the extracting solvent to a 150 ml. beaker and evaporate to dryness. Proceed as directed under assay in the monograph for Antazoline Hydrochloride beginning with, "Add about 25 ml. of water . . ." The amount of antazoline hydrochloride present is not less than 95 nor more than 105 per cent of the labeled amount.

ANTAZOLINE HYDROCHLORIDE SOLUTION:

Identity Tests: The solution responds to the picrate, the color and free base identity tests listed in the monograph for Antazoline Hydrochloride.

Assay: Transfer exactly 20 ml. of the solution to a 1,000 ml. volumetric flask and mix thoroughly. Transfer 10 ml. of this solution to a 100 ml. flask, fill to volume with water and determine the transmission at 2420 A on a spectrophotometer. Estimate the amount of antazoline hydrochloride present from a standard curve obtained by plotting extinction against concentration for several solutions prepared with like constituents and made up to contain between 0.0075 and 0.0150 mg. per ml. of pure antazoline hydrochloride. The amount of antazoline hydrochloride present is not less than 95 nor more than 105 per cent of the labeled amount.

CIBA PHARMACEUTICAL PRODUCTS, INC., SUMMIT, N. J.

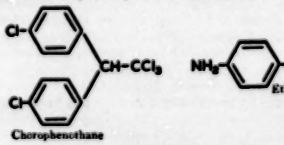
Nasal Solution Antistine Hydrochloride 0.5%: 15 cc. dropper bottles. A solution containing 5 mg. of antazoline hydrochloride in each cc.

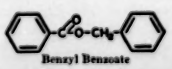
Ophthalmic Solution Antistine Hydrochloride 0.5%: 15 cc. dropper bottles. A solution containing 5 mg. of antazoline hydrochloride in each cc.

Tablets Antistine Hydrochloride: 0.1 Gm.

U. S. patent 2,449,241; U. S. trademark 432,457.

CHLOROPHENOTHANE-BENZOCAINE-BENZYL BENZOATE.—Enbin (WILLIAM COOPER & NEPHEWS).—$C_{14}H_8Cl_6$, $C_9H_{11}O_2N$ and $C_{14}H_{12}O_2$.—M.W. 354.5, 165.19 and 212.24.—An oil-in-water emulsion containing chlorophenothane-U. S. P. (D.D.T.), ethyl aminobenzoate-U. S. P., benzyl benzoate-U. S. P. and an emulsifying agent. The formulas of these substances may be represented as follows:





Actions and Uses.—A mixture of chlorophenothane, benzocaine and benzyl benzoate is used for the treatment of pediculosis and scabies. The primary ingredient, a 1 per cent concentration of chlorophenothane destroys lice; the 2 per cent concentration of benzocaine is an effective ovicide. Benzyl benzoate added in a concentration of 10 per cent or more is effective as a scabicide and to a lesser extent as a pediculicide. Although the mixture is effective against both of these types of skin parasites, it should not be carelessly employed for undiagnosed itching. When scabies alone is the cause, the use of benzyl benzoate is more rational than the application of the mixture. There have been no reports of systemic effects or skin irritation following occasional applications of the mixture. Temporary smarting of tender areas of skin occurs. Because sensitization may follow, repeated applications should be avoided.

Dosage.—For pediculosis either an emulsion or ointment of the mixture should be evenly applied by rubbing in an amount (usually about 60 cc. or Gm.) just sufficient to dampen all hair

V 19

of the region involved and to anoint the underlying scalp or skin. This should remain in contact with the affected areas for 24 to 48 hours and then be removed by washing hair or bathing skin with soap and warm water. It may be necessary to repeat treatment in pediculosis capitis if the hair is washed within a week after treatment. All clothing should be thoroughly laundered or dry cleaned and uncontaminated apparel used after treatment.

For scabies, a preliminary warm, soapy bath should be taken and all contaminated clothing laundered or dry cleaned to prevent reinfestation. All soap should be rinsed from the skin. Either a liquid emulsion or an ointment of the mixture is applied by rubbing over the entire body surface below the neck. All folds of the skin and areas beneath the nails must be treated. The application should be allowed to remain on the skin for at least 24 hours before bathing. The treatment should also be reapplied to the hands after each washing during the treatment period.

One application is usually sufficient to control either pediculosis or scabies, but the application may be repeated after a week if necessary. All contact with the eyes or other mucous membranes should be avoided. To minimize possible irritation in infants, the emulsion of the mixture should be diluted to half strength by adding an equal amount of distilled water.

Tests and Standards.—

Chlorophenothane-benzocaine-benzyl benzoate is a milky liquid when it is shaken to resuspend the solids.

Reflux for 15 minutes 10 ml. of chlorophenothane-benzocaine-benzyl benzoate with 50 ml. of 0.1 *N* alcoholic potassium hydroxide. Add 100 ml. of distilled water and cool to room temperature. Add 3 ml. of nitric acid and 25 ml. of 0.1 *N* silver nitrate, followed by 0.5 Gm. of powdered ferric sulfate and 5 ml. of nitrobenzene. Swirl the flask to coagulate most of the precipitate. Titrate the excess silver nitrate with 0.1 *N* ammonium thiocyanate until a faint pink color appears. Cross titrate with both standard solutions, so that the end point, which is not too sharp, can be rechecked. Each ml. of 0.1 *N* silver nitrate consumed is equivalent to 0.03345 Gm. of chlorophenothane; the amount of chlorophenothane is not less than 85 or more than 115 per cent of the claimed amount.

Dissolve 10 ml. of chlorophenothane-benzocaine-benzyl benzoate in 55 ml. of dilute hydrochloric acid (1:10), cool the solution to 15 C. and and add about 25 Gm. of crushed ice. Titrate with 0.1 M sodium nitrite until a blue color is formed instantaneously when a glass rod dipped in the solution is streaked on starch-iodide paste T.S. When the titration is complete, the end point is reproducible after the mixture has been allowed to stand for 1 minute. Each ml. of 0.1 M sodium nitrite consumed is equivalent to 0.01652 Gm. of ethyl aminobenzoate; the amount of ethyl aminobenzoate is not less than 95 or more than 105 per cent of the claimed amount.

BENZOCAINE: The benzocaine used in the manufacture of chlorophenothane-benzocaine-benzyl benzoate conforms to the U.S.P. standards for ethyl aminobenzoate.

BENZYL BENZOATE: The benzyl benzoate used in the manufacture of chlorophenothane-benzocaine-benzyl benzoate conforms to the U.S.P. standards for this substance.

WILLIAM COOPER & NEPHEWS, INC., CHICAGO 14.

Emulsion Enbin: 90 cc. bottles. An emulsion containing 10 mg. of chlorophenothane-U. S. P., 20 mg. of ethyl aminobenzoate-U. S. P. and 0.113 Gm. of benzyl benzoate-U. S. P. Stabilized with polyoxalkylene derivative of sorbitan monooleate.

Council on Foods and Nutrition

The following statement was accepted by the Council at its annual meeting in 1949. JAMES R. WILSON, M.D., *Secretary.*

PESTICIDES: A STATEMENT CONCERNING NEEDED INFORMATION

The introduction of numerous new synthetic organic pesticides offers promise for increasing the nation's food supply and improving health through the control of insects and other pests. Past experience, however, indicates that poisons cannot be used safely on food crops without the development of certain fundamental knowledge concerning the poison. What these materials will do to pests and food crops and to the workers who handle them, must be known, and there must be developed, also, a knowledge of what these materials will do to warm-blooded animals and man when small amounts of residue are incorporated in their foods. Furthermore, practical methods of analysis should be available to permit identification and measurement of residue that may persist on or in consumer products. Such essential information is undeveloped for many of the agricultural poisons now in use.

It is the opinion of the Council on Foods and Nutrition that the information on the following factors should be supplied before pesticides, that may contaminate food or forage crops, are released for general use: (1) Chronic as well as acute toxicity tests. These should be carried out in such a manner as to demonstrate satisfactorily the toxicologic effects of pesticides on warm-blooded animals and man. (2) Accurate methods of isolation and quantitative determination of pesticide residues in biologic material. These methods must be sufficiently rapid as to be of practical use in the examination of perishable foods.

Thorough pharmacologic investigations and practical quantitative methods are two of the most vital and pressing current needs in this field. The fundamental requirement for the orderly development of needed information must not be ignored. Unless this information is supplied, safe methods for handling and use cannot be developed. Furthermore, unless this information is supplied before new agricultural poisons are released for general distribution, accidents may occur which will offset the potential benefits of these new materials and cause delay in their adoption.

REPORT OF THE COUNCIL

The following products have been accepted as conforming to the rules of the Council. JAMES R. WILSON, M.D., *Secretary.*

H. J. Heinz Company, Pittsburgh

HEINZ CHOPPED VEGETABLES AND BACON WITH CEREAL. Ingredients: Potatoes, carrots, tomato juice, smoked bacon, wheat flour, onions, celery, peas, rice, salt, dried yeast, parsley and water to prepare.

Analysis (submitted by manufacturer).—Total solids 13.01% total sugar (as sucrose) 0.87%, acidity (as citric) 0.08%, protein (N × 6.25) 1.33%, fat (by acid hydrolysis) 3.70%, crude fiber 0.28%, ash 0.99%, total carbohydrates (by difference) 6.70%.

Vitamins and Minerals	*Per Hundred Grams*
Vitamin A	3,200 I.U.
Thiamine	0.118 mg.
Riboflavin	0.061 mg.
Ascorbic acid	1.1 mg.
Nicotinic acid	0.59 mg.
Calcium	18.0 mg.
Phosphorus	21.0 mg.
Iron	0.1 mg.
Copper	0.05 mg.
Salt	760.0 mg.

Calories.—0.65 per gram; 18 per ounce.

Use.—As a food for older infants as well as for convalescents, the aged and others requiring special diets.

H. J. Heinz Company, Pittsburgh

HEINZ CHOPPED VEGETABLES AND BEEF WITH CEREAL. Ingredients: Carrots, potatoes, boneless beef chuck (broth and cooked meat), peas, onions, wheat flour, whole pearl barley, salt, celery, beef extract, parsley and water to prepare.

Analysis (submitted by manufacturer).—Total solids 13.23%, total sugar (as sucrose) 0.93%, acidity (as citric) 0.11%, protein (N × 6.25) 3.06%, fat (by acid hydrolysis) 0.41%, crude fiber 0.31%, ash 1.38%, total carbohydrates (by difference) 8.00%.

Vitamins and Minerals	*Per Hundred Grams*
Vitamin A	1,280 I.U.
Thiamine	0.017 mg.
Riboflavin	0.062 mg.
Ascorbic acid	1.3 mg.
Nicotinic acid	1.27 mg.
Calcium	11.0 mg.
Phosphorus	40.0 mg.
Iron	0.05 mg.
Copper	0.11 mg.
Salt	1,010.0 mg.

Calories.—0.48 per gram; 14 per ounce.

Use.—As a food for older infants as well as for convalescents, the aged and others requiring special diets.

The Chicago Dietetic Supply House, Chicago

CELLU TOMATO RICE SOUP consists of unsalted concentrated tomato puree, dry rice, a small amount of beef extract for flavoring and water.

Analysis (submitted by manufacturer).—Moisture 93.21%, reducing sugars before inversion (as invert sugar) 1.04%, increase in reducing sugars after inversion (as sucrose) 0.06%, starch 0.32%, crude fiber 0.09%, undetermined substances (by difference) 3.98%, protein (N × 6.25) 0.94%, ether extract (crude fat) 0.02%, ash (including sodium) 0.34%, sodium 0.0164%.

Calories.—0.26 per gram; 7.4 per ounce.

Use.—A useful adjunct for the planning of low fat, low sodium dietaries.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO 10, ILL.

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Editor for Current Medical Literature, GEORGE HALPERIN, M.D.

Subscription price - - - - Twelve dollars per annum in advance

Cable Address - - - - "Medic, Chicago"

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SATURDAY, JANUARY 28, 1950

NEW ANTIBIOTICS

The number of antibiotic agents is constantly increasing, and each new issue of a bacteriologic journal contains some reference to antibiotics. Many of these, however, are too toxic for use in human beings, and only a few find application in parenteral treatment. At the 1949 meeting of the American Society of Tropical Medicine, in Memphis, Tenn., a group of workers from the Hektoen Institute for Medical Research of the Cook County Hospital in Chicago reported on a number of recently introduced antibiotics, with special regard to their possible use in the tropics. According to these workers, neomycin has only about one-tenth the toxicity of streptomycin but is about five times more active. Neomycin was found to inhibit the growth of tubercle bacilli, salmonellae, brucellae, cholera vibrios and Endameba histolytica in vitro and in vivo. Moreover, as Waksman, the discoverer of this antibiotic, already has stated, organisms do not develop neomycin resistance. The status of polymyxin, or aerosporin as it is called by British authors, is still confused. Polymyxin seems to have at least four forms. One form, polymyxin D, is active against gram-negative organisms and rickettsiae. It has little toxicity. Enniatine, which was discovered in Switzerland, is a promising agent against acid-fast organisms but is irritating in its present form. Bacitracin has been found effective against gram-positive organisms, vibrios, rickettsiae and some viruses, including the virus of variola. Chloramphenicol (chloromycetin®) and aureomycin have about the same range of activity, the former being less toxic but possessing only a bacteriostatic effect. Penicillin still is regarded as the drug of choice in infections with gram-positive organisms and treponemataceae.

New hope and enthusiasm are aroused whenever a new antibiotic is described. However, test tube experiments and even animal testing, though worth while, are not absolutely reliable indicators of the usefulness of drugs in human medicine. Final judgment must be reserved until adequate clinical experience has been gained with them. One has to keep in mind also that the susceptibility of micro-organisms to antibiotics varies greatly. Furthermore, patients, and not their microbes, are treated. Drugs only repress the growth of infectious agents until the body can develop its own defenses. Antibiotics which would heal tuberculotic cavities or amebic ulcerations cannot be imagined. The task of the physician in the future will not be simplified by the introduction of new drugs. On the contrary, he will be faced with new problems. He will have to maintain close cooperation with the bacteriologic laboratory to be informed about the species of the causative agent, its susceptibility to a long series of antibiotics and the blood levels achieved by the medication. The use of neomycin, bacitracin, polymyxin and other new antibiotics perhaps may make possible the control of more pathogenic organisms, but the treatment of the damages caused by these microbes will remain a special task, requiring much medical skill and experience and individual attention.

RADIO TRANSCRIPTION SERVICES

The first radio transcriptions distributed by the Bureau of Health Education through county medical societies were produced experimentally in 1941. The series was entitled "Before the Doctor Comes" and was keyed to wartime emergency situations, because doctors had been withdrawn from civilian life to serve the armed forces and minor emergencies in the home often had to be handled without medical advice. Ten sets of thirteen programs each were produced with the possibility in mind that some of these might be wasted through nonuse. At this writing, the electrical transcription service by the American Medical Association to state and county medical societies, and through them to health departments and voluntary health agencies, has grown to twenty series of programs currently in use, with a hundred sets of each in circulation. In 1948 and 1949 these "platters" were used in excess of 10,000 local broadcasts in every important area of the United States, including Alaska and Hawaii. Several series have been broadcast in Canada. A representative sample set has been sent on request to the British Broadcasting Corporation for study.

A recent survey shows that 150 more stations have broadcast from these platters in Illinois, Michigan, North Carolina, Ohio, Pennsylvania and Tennessee. Ten to fifteen stations each in the states of California, Indiana, Minnesota, New York and Virginia

have broadcast from these transcriptions. Only eleven states did not use our recordings in 1949, and there is no state, including the territories mentioned above and the District of Columbia, in which there has not been some use of these transcriptions during the past nine years.

The state medical societies of Pennsylvania, Tennessee, Florida, New Jersey, Louisiana, Alaska, Hawaii, Oregon, Arizona, New Mexico, Washington and Iowa have become regular distributors of transcriptions within their state borders. These societies are provided with new transcriptions direct from the factory, and all requests from within the state are handled through them. Other stations are serviced by the Bureau of Health Education through the county medical societies in that area. There are now approximately 2,000 radio stations in the United States. The transcriptions of the American Medical Association have been broadcast on more than 600 of these stations. A spot map shows no area in the United States in which one of these transcriptions has not been heard at some time. More than 250 stations are active at any one time.

Transcriptions cover all areas of health and medical interest and employ various radio technics to appeal to all tastes. Modern radio devices such as dramatization, interviews, music, discussion forums, narration and tape recordings of actual events are employed. The work is done by experienced professional radio artists, and the broadcasting talent employed is drawn from among well known radio personalities in the New York and Chicago production centers. Transcriptions offer a worth while service and aid materially in meeting some of today's health problems. Their use in part depends on the support of county and state medical societies, but, in turn, transcriptions can aid the work of the medical organizations.

ABUSE OF THYROID MEDICATION

The introduction of a new drug to the medical profession, especially if it appears to possess truly important therapeutic value, usually is attended with several phases of promotion and, unfortunately, confusion. The first period too often is one of ballyhoo during which the drug may be used without discrimination and for conditions which only superficially resemble those for which it has been recommended. This period may be followed by one of reaction against the drug, especially if unpleasant side effects are associated with its use. A third phase of the adoption of a drug by the medical profession is the period of adjustment during which its value is properly assessed. An exception to this procedure appears to be thyroid extract, a potent and invaluable medicament in certain conditions but dangerous when improperly used. Perhaps the answer lies in part in the fact that thyroid extract exerts its effect directly or indirectly on a chain of endocrine glands which interact with each other, e.g., thyroid, pituitary, adrenal and sex glands. Thus the effect of thyroid medication is not limited to one type of tissue.

Excessive doses of thyroid extract may cause the symptoms usually associated with hyperthyroidism, i.e., tachycardia, sometimes auricular fibrillation, nervousness, insomnia, loss of weight and even exophthalmos, which, for some reason, is usually unilateral. It also may cause damage to the liver through overstimulation of the adrenals and, through action on the hypophysis, such symptoms as polyuria and polydipsia, hypertension with glycosuria and menstrual derangements. There is suggestive evidence that the use of excessive doses by pregnant women may damage the nervous system of the unborn child and lead to mongolism. It should be noted, too, that in some patients with myxedema thyroid extract may cause anginal attacks and that some patients are hypersensitive to the medication.

With all this information available in the literature one wonders why there is such indiscriminate use of thyroid extract. Unfortunately, some of the laity, particularly obese women, have learned that the drug can cause a reduction in weight. Some of these women were treated originally with proper doses by physicians but have increased their daily intake without their physicians' knowledge and consent. Others have heard of the weight-reducing property of the medicine and have purchased it without a doctor's advice either as thyroid or concealed under some fancy name in patent medicine. None of the persons who resort to self medication realize that the reduction in weight is due to disturbances in metabolism and is not a directly selective action. Physicians are not entirely blameless if in some instances they begin treatment with too large doses and in others they use thyroid when the basal metabolic rates are below normal, without remembering that the metabolic rates of some persons vary and that a low metabilic rate is not always indicative of subnormal thyroid activity.

There are several procedures that would aid in correcting the overuse of thyroid extract: Laws in all states prohibiting the sale of this medicament except on a physician's prescription; general recognition that thyroid treatment should be begun with minimal

doses, as thyroid acts slowly and cumulatively, and education of the public against the dangers of this potent substance. Thyroid extract still, in spite of repeated warnings, is being used indiscriminately, and abuse of this drug should be corrected.

Current Comment

EXPERIMENTAL ATHEROSCLEROSIS

Interest in research on atherosclerosis recently has been increased, and remarkable progress has been made in devising new methods for the experimental production of this disease, in elucidating the factors involved in its causation and in discovering agents that seem to inhibit its development.[1] Some of the recent observations have clinical significance. Bevans and his associates[2] showed that repeated intravenous injections of colloidally dispersed cholesterol in rabbits resulted in the appearance of atheromatous plaques. Their observations implicate the intravenous use of fat emulsions as a possible cause of similar vascular complications in man. Other evidence has demonstrated specificity for species of animals, of various atheromatogenic mechanisms and of different "antiatherosclerotogenic" agents. Atherosclerosis in dogs develops only when cholesterol feeding is combined with the administration of thiouracil, i. e., a depression of thyroid function,[3] an experimental procedure that appears to fail in rats. Although dietary hypercholesteremia in rabbits results consistently in atherosclerosis, Duff and Payne[1] found this effect absent in alloxan diabetes, while the removal of the pancreas in the chick did not lead to the marked derangements of the lipid metabolism and to the early vascular lesions observed in diabetic patients.[2] Stamler and associates[1] found, moreover, that the giving of thyroid to chicks on regular mash did not prevent and even may have aggravated spontaneous atherosclerosis, unlike its effect on cholesterol-forced atherosclerosis of rabbits and chicks. Likewise, choline and inositol administration did not inhibit but tended to accentuate atherosclerosis in cholesterol-fed chicks, although such an effect has consistently been obtained in cholesterolized rabbits. While the administration of estrogens causes hypercholesteremia in chickens and thus presumably aggravates the development of atherosclerosis, Eilert[1] recently concluded that the action of estrogens might be related to the lower incidence of arteriosclerosis in women, particularly before the climacterium, because of the sharp reduction in the ratio of total cholesterol to lipid phosphorus following estrogen administration. However, species specificity imposes limitations on the applicability of experimental findings to the human problem. In view of the fivefold rise of plasma cholesterol over that of phospholipids observed in dogs given cholesterol and thiouracil, Davidson and associates[1] expressed the opinion that changes in the phospholipid-cholesterol ratio may be as important as hypercholesteremia in the development of experimental atherosclerosis, because most of the cholesterol in serum is not in true solution but in colloidal form presumably stabilized by the phospholipids and serum proteins. This observation and the finding of Holman,[1] that there is evidence for the development of arterial lesions, human and experimental, by episodic changes, indicate that persistent or transitory disturbances of the colloidal plasmatic equilibrium are involved in human atherosclerotogenesis.

1. Proceedings of the American Society for the Study of Arteriosclerosis, Am. Heart J. **38**: 466, 1948; ibid. **38**: 453, 1949.
2. Bevans, M.; Kendall, F. E., and Abell, L. L.: Development of Atheromatous Plaques Following Production of Intimal Atherosclerosis by Intravenous Injection of Colloidal Cholesterol into Rabbits, Am. Heart J. **36**: 473, 1948. Steiner, A.; Davidson, J. D., and Kendall, F. E.: Further Studies on the Production of Arteriosclerosis in Dogs by Cholesterol and Thiouracil Feeding, Am. Heart J. **36**: 477, 1948.
3. Stamler, J.; Bolene, C.; Katz, L. N.; Harris, R.; Silber, E. N.; Miller, A. J., and Akman, L.: Studies on Spontaneous and Cholesterol-Induced Atherosclerosis and Lipid Metabolism in the Chick: The Effects of Some Lipotropic and Hormonal Factors, Am. Heart J. **38**: 466, 1949.

EFFECTS OF UNDERFEEDING

The effects of restriction of food energy have been widely investigated, for the opportunities for such study have been presented in connection with both widespread starvation and experimental inanition. Increase in body weight is regularly curtailed under these conditions, but it is a matter of record that disproportional skeletal growth persists.[1] Metabolic functions as measured by oxygen consumption show a diminution during persistent underfeeding,[2] and the pattern of behavior and response adjusts itself to the restriction of calories.[3] In the light of the foregoing observations, it would appear that under nutritional stress of this kind, the general restrictions noted represent the adjustments of the organism in the direction of eliminating the dispensable functions in order to preserve the integrity of the essential ones. A recent report[4] of the influence of low calory intake on certain of the endocrine systems supports this view. Two groups of mice, one well fed and the other receiving only two thirds as many calories, were examined for adrenal cortical activity and for gonadotropic activity. On the basis of various indirect functional approaches, it was shown that under the experimental conditions of nutritional stress the pituitary adrenal cortical hormone mechanism was highly active, whereas there was a lowered secretion of the gonadotropic hormones as shown by the decrease in the weight of the ovaries and uterus and the cessation of estrus. It appears that under these conditions of undernutrition emphasis is shifted away from hormone activity, which is required only incidentally, toward the endocrine mechanism, which is essential to life.

1. Winters, J. C.; Smith, A. H., and Mendel, L. B.: Am. J. Physiol. **80**: 576, 1927.
2. Zuntz, N., and Loewy, A.: Biochem. Ztschr. **90**: 244, 1918.
3. Anderson, J. E., and Smith, A. H.: J Comp. Psychol. **13**: 409, 1932. Taylor, H. L.; Brozek, J.; Henschel, A.; Mickelson, O., and Keys, A.: Am. J. Physiol. **143**: 148, 1945.
4. Boutwell, R. K.; Brush, M. K., and Rusch, H. P.: Am. J. Physiol. **154**: 517, 1948.

V 19

ORGANIZATION SECTION

Official Notes

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES

The Board of Trustees held meetings in Washington preceding and during the Clinical Session of the Association; a full day meeting of the Executive Committee also was held on Saturday, December 3. Some of the proceedings of the Board are here reported.

Council on Pharmacy and Chemistry

Dr. Robert T. Stormont, formerly medical director of the Food and Drug Administration and a member of the Council on Pharmacy and Chemistry, was elected to succeed Dr. Austin Smith as Secretary of the Council. Dr. Carl A. Dragstedt, Chicago, was appointed to succeed Dr. Stormont as a member of the Council. Dr. Morris Fishbein, Dr. G. W. McCoy, Dr. Perrin H. Long and Dr. E. M. Nelson were elected to succeed themselves on the Council. Dr. Harold Kautz was appointed Associate Secretary and Dr. Paul Wermer, Assistant Secretary of the Council.

Bureau of Investigation

Mr. Oliver Field, an attorney, who has been directing the work of the Bureau of Investigation for the past year, was appointed Director of that Bureau.

Appointments

The following appointments were made to fill vacancies on editorial boards, councils and committees (unless otherwise specified, the appointee is to succeed himself):

American Journal of Diseases of Children: Dr. Robert Lawson, Winston-Salem, N. C., to succeed Dr. Fritz B. Talbot (resigned). *Archives of Dermatology and Syphilology:* Dr. A. C. Cipollaro, New York, to succeed Dr. George M. McKee. *Archives of Internal Medicine:* Dr. George E. Burch and Dr. Paul S. Rhoads, Chicago, as chief editor, to succeed Dr. N. C. Gilbert (resigned). *Archives of Neurology and Psychiatry:* Dr. Tracy J. Putnam. *Archives of Ophthalmology:* Dr. William F. Hughes Jr., Chicago, to succeed Dr. F. C. Cordes (resigned). The following associate members of the editorial board of the *Archives of Ophthalmology* were appointed:

Dr. James H. Allen	Dr. Irving H. Leopold
Dr. John G. Bellows	V. Everett Kinsey, Ph.D.
Dr. Milton L. Berliner	Kenneth Ogle, Ph.D.
Dr. Hermann M. Burian	Dr. A. E. Maumenee
Dr. F. Bruce Fralick	Dr. C. Wilbur Rucker
Dr. Michael J. Hogan	Dr. Harold G. Scheie

Archives of Pathology: Dr. William B. Wartman, Chicago, to succeed Dr. Ludvig Hektoen (resigned). *Archives of Otolaryngology:* Dr. Westley M. Hunt. *Archives of Surgery:* Dr. Alfred Blalock; Dr. Frank Hinman Jr., San Francisco, to succeed Dr. A. J. Scholl, and Dr. Barnes Woodhall, Durham, N. C., to succeed Dr. Cobb Pilcher (deceased). Council on Industrial Health: Dr. Warren Draper and Dr. Henry H. Kessler; Dr. Oscar Sander, Milwaukee, to succeed Dr. Raymond Hussey, who has been employed as Scientific Director of the Council. Council on Physical Medicine and Rehabilitation: Dr. A. C. Cipollaro, Dr. M. A. Bowie and Dr. G. M. Piersol; Dr. Howard A. Rusk, New York, to succeed Dr. H. B. Williams (resigned). Council on Foods and Nutrition: Dr. Charles S. Davidson and Dr. Harry H. Gordon to succeed Dr. Harold C. Stuart (resigned) and Dr. Morris Fishbein. Committee for the Protection of Medical Research: Dr. W. J. Kerr and Rev. A. M. Schwitalla. Committee on Medical Motion Pictures: Dr. William L. Benedict; Dr. Edwin Jordan, Cleveland, to succeed Mr. John G. Bradley; Dr. Joseph Barr, Boston, to succeed Dr. Dean F. Smiley. Council on National Emergency Medical Service: Dr. Herbert Wright, Cleveland, to succeed Dr. Winchell Craig.

Dr. H. B. Mulholland, Charlottesville, Va., was appointed to represent the American Medical Association on the National Committee for the Midcentury White House Conference on Children and Youth, and Dr. F. J. L. Blasingame, to represent the Association at the meeting of the American Farm Bureau Federation.

Coordination Committee on Legislation

The Board, at the request of the House of Delegates, appointed the following Coordination Committee on Legislation:

Dr. Harvey B. Stone, Baltimore
Dr. J. D. McCarthy, Omaha
Dr. F. J. L. Blasingame, Wharton, Texas
Dr. Dwight H. Murray, Napa, California
Dr. W. J. Dattelbaum, Brooklyn
Dr. W. H. Huron, Iron Mountain, Mich.
Dr. Oscar B. Hunter, Washington, D. C.
Executive Committee of the Board of Trustees, ex officio

The Board of Trustees also has taken recently the following actions:

Grant for National Fund for Medical Education

A grant was approved by the Finance Committee for the National Fund for Medical Education to complete the initial fund of $100,000 which was deemed necessary to establish the Fund.

Chairman of Local Committee on Arrangements for Denver Clinical Session

The nomination by the Colorado State Medical Society of Dr. Samuel P. Newman as Chairman of the Local Committee on Arrangements for the Clinical Session to be held in Denver in 1950 was confirmed by the Board.

A. M. A. Broadcast

Distinguished American physicians and their achievements will be the subject of an outstanding radio series for 1950-1951, in accordance with the program approved by the Board.

Archives of Industrial Hygiene and Occupational Medicine

At the September meeting, when the subscription prices of the special journals were increased, that of the *Archives of Industrial Hygiene and Occupational Medicine*, the first issue of which was to be in January 1950, was increased to $10. It was later decided that the subscription price originally announced —$8—should be retained.

Hygeia

Authorization has been given by the Board for the adoption of an emblem for products accepted for advertising in *Hygeia* and for a change in name to *Today's Health.* The subtitle *Formerly Hygeia* is to be carried on the cover for a year, and the following statement will be carried permanently in the masthead: Established in 1923 as *Hygeia*, the Health Magazine.

Dr. W. W. Bauer was appointed editor and Dr. W. W. Bolton associate editor of *Hygeia.*

Representatives

Dr. Donald C. Smelzer was appointed to act as the representative of the American Medical Association to the National Federation of Licensed Practical Nurses, Inc.

Washington Letter

(From a Special Correspondent)

Jan. 23, 1950.

President Again Asks Health Insurance

In his budget message to Congress, President Truman again recommended enactment of compulsory health insurance and proposed a 0.25 per cent payroll tax on workers and employers, beginning January 1951, receipts to go into a government trust fund for financing of preliminary expenses in launching the vast program. The Bureau of the Budget estimated that this "overture tax" would raise $250,000,000.

For the fiscal year beginning July 1, 1950, a total of $2,714,000,000 is earmarked for health, social security and welfare, subject to approval by Congress. Somewhat more than two thirds of this figure would be expended by the Federal Security Agency. Items include $30,000,000 to launch a new program of federal aid to medical, dental and nursing schools, $25,000,000 for distribution among the states for school health services and $5,000,000 to strengthen local public health units. All three projects are predicated on enactment of enabling legislation, which has been passed by the Senate and is now awaiting House approval.

Integration of Federal Medical Services

The annual Federal Hospital Luncheon, held at the Hotel Lafayette January 12, featured talks by Dr. Leonard A. Scheele, Surgeon General of U. S. Public Health Service, and Brig. Gen. Wallace H. Graham, President Truman's personal physician. Dr. Scheele presented a review of pending health legislation and urged closer integration of the federal government's medical and hospital services, both military and civilian. Whatever action Congress may take on establishment of a Department of Health or of a United Medical Administration, much can be done now toward avoiding duplicated effort and effecting long range planning in coordinated fashion, the Surgeon General asserted. Dr. Graham said that President Truman is intensely interested in the administration of the government's numerous health, hospital and medical care programs and discusses the subject with him frequently.

Among those who attended the luncheon, which was arranged by the Bureau of the Budget, were Dr. Richard L. Meiling, director of medical services, Department of Defense; Major Gen. George E. Armstrong, Deputy Surgeon General of the Army; Rear Adm. H. L. Pugh, Deputy Surgeon General of the Navy; Brig. Gen. Dan C. Ogle, Deputy Surgeon General of the U. S. Air Force; Dr. Arden Freer, Deputy Medical Director of the Veterans Administration; Dr. Norvin C. Kiefer, director of the health resources division, National Security Resources Board, and Dr. Fred T. Foard, health director of the Bureau of Indian Affairs.

Veterans Administration Operating 107,262 Beds

On Dec. 31, 1949, the Veterans Administration was operating 130 hospitals with a capacity of 107,262 beds, according to its final statistical report for the year. The total was made up of 18 tuberculosis hospitals (9,117 beds), 33 neuropsychiatric hospitals (48,874 beds) and 79 general hospitals (49,271 beds). In addition, 16 domiciliary units were in operation, with a total of 17,177 beds. In various stages of construction when the year ended were two neuropsychiatric hospitals (2,965 beds), two tuberculosis hospitals (800) and 40 general medical and surgical hospitals (15,941). Largest of the institutions now being built are at Pittsburgh, East Orange, N. J., and in New York State: Albany, Brooklyn, Buffalo and Peekskill. Pittsburgh and Peekskill are for neuropsychiatric cases and the others are general, with all six having 1,000 or more beds each.

President Truman's Federal Budget Criticized

The Council of State Chambers of Commerce on January 13 issued a statement criticizing the government's proposed budget of $42,439,000,000 for the fiscal year 1950-1951 now awaiting congressional action. Among proposed projects singled out as financially inexpedient were creation of a National Science Foundation which, according to the Council, "would eventually entail annual outlays of $100,000,000 and up"); expansion of the social security program along the lines of H. R. 6000, which has passed the House and now awaits Senate approval, and increasing of the grants-in-aid program to state and local governments to an all-time high figure of $2,999,000,000.

FTC Cites Skin Culture Institute, Inc., for False Advertising

Skin Culture Institute, Inc., of New York City, has been ordered by the Federal Trade Commission to cease advertising claims that its cosmetic products are medically effective in improving the condition or appearance of the skin. The company also was forbidden use of the word "Institute" in its name, on the ground that it connotes a nonprofit enterprise devoted to research. "Actually, the respondent corporation is a commercial enterprise conducted for profit and is not engaged in the activities of an institute," the Commission stated in its order.

"Medical Aspects of Atomic Weapons"

John R. Steelman, acting chairman of the National Security Resources Board, has announced that NSRB is sending copies of "Medical Aspects of Atomic Weapons" to chief executives of all states and territories for guidance in development of state and local civil defense planning. The report, which describes the types of casualties resulting from an A-bomb burst, was prepared for NSRB by the Department of Defense and the U. S. Atomic Energy Commission.

FTC Medical Bureau Submits Annual Report

In its annual report transmitted to Congress January 9, the Federal Trade Commission stated that its Bureau of Medical Opinions had prepared 279 written opinions in 1948-1949. The bureau furnishes scientific information and medical opinions required in development and drafting of formal complaints and the negotiation of stipulation agreements. During the year, 39 experts testified as witnesses in Commission cases.

House Committee Defers Action on Health Bills

The House Committee on Interstate and Foreign Commerce held its first meeting of the new session of Congress on January 11 for the purpose of discussing precedence of handling several major health bills, among other pending legislation, which were held over from 1949. However, no decisive action was taken and another meeting was scheduled for January 17.

Coming Medical Meetings

Annual Congress on Industrial Health, New York, Roosevelt Hotel, Feb. 20-21. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Palmer House, Feb. 3-7. Dr. Donald G. Anderson, 535 N. Dearborn St., Chicago, Secretary.

National Conference on Rural Health, Kansas City, Mo. Feb. 3-4. Dr. F. S. Crockett, 535 N. Dearborn St., Chicago, Chairman.

American Academy of Allergy, Los Angeles, Hotel Biltmore, March 6-8. Dr. Theodore L. Squier, 208 E. Wisconsin Ave., Milwaukee 2, Secretary.

American Academy of General Practice, St. Louis, Kiel Auditorium, Feb. 20-23. Mr. Mac F. Cahal, 406 W. 34th St., Kansas City, Mo., Executive Secretary.

American Academy of Orthopedic Surgeons, New York, Waldorf-Astoria Hotel, Feb. 11-16. Dr. Harold B. Boyd, 869 Madison Ave., Memphis, Tenn., Secretary.

American Goiter Association, Houston, Texas, March 9-11. Dr. George C. Shivers, 100 E. St. Vrain St., Colorado Springs, Secretary.

American Society for Surgery of the Hand, New York, Feb. 10-11. Dr. Joseph H. Boyes, 1401 S. Hope St., Los Angeles 15, Secretary.

Dallas Southern Clinical Society, Dallas, Texas, March 13-16. Miss Betty Elmer, 1133 Medical Arts Bldg., Dallas 1, Executive Secretary.

Michigan Postgraduate Clinical Institute, Detroit, Book-Cadillac Hotel, March 8-10. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.

New Orleans Graduate Medical Assembly, New Orleans, Municipal Auditorium, March 6-9. Dr. Woodard D. Beacham, 1430 Tulane Ave., New Orleans, Secretary.

South Atlantic Association of Obstetricians and Gynecologists, Roanoke, Va., Hotel Roanoke, Feb. 9-11. Dr. Emmett D. Colvin, 1259 Clifton Road N.E., Atlanta 6, Ga.

Southeastern Allergy Association, Columbia, S. C., Columbia Hotel, Feb. 11-12. Dr. Katharine B. MacInnis, 1515 Bull St., Columbia 49, S. C., Secretary.

Southeastern Surgical Congress, Washington, D. C., March 6-9. Dr. Benjamin T. Beasley, 45 Edgewood Ave. S.E., Atlanta 3, Ga., Secretary.

GOVERNMENT SERVICES

AIR FORCE

SCHOOL OF AVIATION MEDICINE

During the year 1949 a total of 451 students graduated or completed prescribed courses in various fields of aviation medicine at the Air Force School of Aviation Medicine, Randolph Field, Texas. The total includes 259 officers, 192 enlisted men and one civilian of the Texas State Health Department who took the health physics course. The officer group included four National Guard officers and 15 foreign officers. The School of Aviation Medicine trains also U. S. Army and Navy officers to give physical examinations for flying, and they are on loan to the Air Force for one year. The school also trains flight nurses for the Navy and Air Force. Completing the Flight Nurse course during the last year were three nurses of the Royal Canadian Air Force. The courses given at the school vary from the 15 day Health Physics Technician course to the nine month course in Basic Aviation Medicine. In addition to the aforementioned groups, the school trained eight officers of the Medical Service Corps for Pararescue teams. The Commandant of the School of Aviation Medicine since last July has been Brig. Gen. Otis O. Benson Jr., who succeeded Major Gen. Harry G. Armstrong, now Surgeon General of the Air Force.

PUBLIC HEALTH SERVICE

EPIDEMICS AND DISASTERS IN 1949

Seventeen states in which epidemics or disasters occurred during 1949 received emergency aid from the Communicable Disease Center, a division of the Public Health Service with headquarters at Atlanta, responsible for providing assistance to state health departments in meeting public health emergencies.

Five states called on the center for aid in poliomyelitis outbreaks. The most extensive investigation was in Muskegon, Mich., where a twelve member epidemiologic team conducted a thorough study of the poliomyelitis epidemic. Experts from the center also investigated probable poliomyelitis outbreaks in Enid, Okla.; Lee County, Kentucky; in Arkansas and in Emanuel County, Georgia. Five other epidemics, believed to have been of encephalitis, were investigated in Weld and Morgan counties, Colorado, in Waycross, Ga., and in Barnes and Cass counties, North Dakota.

Floods predominated among the disasters. The center furnished personnel, supplies and other assistance during floods in the following areas: Rensselaer County, New York, Colorado and nearby states, Dallas and Fort Worth, Texas, and in the Arkansas River Valley of southern Colorado.

INDUSTRIAL HYGIENE FIELD STATION

The first field station of the Industrial Hygiene Division to be established west of the Mississippi is now in operation at the base of the Wasatch Mountains, on the Fort Douglas Annex campus of the University of Utah. A completely equipped laboratory includes laboratory bench space extending for about 100 feet, two chemical fume heads and an instrument room for such delicate equipment as the petrographic microscope and dust microscope. A library and lecture room are located on the second floor. Offices are on both the first and second floors. The laboratory was established to facilitate technical services to state industrial hygiene agencies, for presenting industrial hygiene subjects to university students and to provide industrial hygiene laboratory facilities for graduate students. Station services are now limited to laboratory and engineering help and technical advice to state industrial hygiene units.

CHEMICAL PHARMACOLOGY SECTION ESTABLISHED

A Chemical Pharmacology Section has been established as a part of the research program of the National Heart Institute, and the Surgeon General has appointed Bernard B. Brodie, Ph.D., associate professor of biochemistry at the New York University College of Medicine, to direct the section.

The Chemical Pharmacology Section is the first of three laboratory sections which will be devoted to basic research conducted within the National Heart Institute. Other laboratory sections to be activated later include four combined clinical-laboratory sections and four research clinics. The sections and clinics now being organized comprise the nuclei of larger groups which will conduct the Heart Institute's intramural research program. This expanded program is scheduled to get fully underway when facilities become available in the new 500 bed Clinical Center, costing $40,000,000, now being constructed for the National Institutes of Health. Along with laboratory facilities, the Heart Institute will have available in the new center 105 hospital beds for patients.

Dr. Brodie, who will be responsible for planning and directing scientific investigations, was born in Liverpool, England, in 1909, received his B.S. degree from McGill University, Montreal, and his Ph.D. from New York University.

BLOOD-SCREENING PROGRAM

The Public Health Service, in cooperation with the District of Columbia Department of Health, conducted a blood-screening program in a new public health trailer laboratory in Washington, D. C., Nov. 15-20. The mobile laboratory represents one of the first steps in the development of the service's plan for working out multiple screening programs. From one specimen, blood tests were made to determine the Rh factor and blood type and the possible indication of diabetes, anemia and syphilis. Persons who, on the basis of screening tests, were suspected of having diabetes, anemia or syphilis were referred for diagnosis to the physician whose name they had given on their registration form. In each such case, the physician was notified of the test results and of the technic used. The patient was advised to see his physician for further information. The Surgeon General of the Public Health Service, in commenting on the proposed tests in the new laboratory, said, "The development of methods for early testing for the presence of illness is one of the most promising devices in the practice of preventive medicine. This laboratory, which will permit rapid blood testing for signs of diseases in their early stages, represents a real achievement. As a demonstration project, it should be of very considerable value in illustrating the potentialities of this method of testing."

SYMPOSIUM ON CARDIOVASCULAR SURGERY

A symposium on Recent Advances in Cardiovascular Surgery will be held January 21 at the Mayflower Hotel, Washington, D. C. Some 200 medical scientists from all parts of the country are expected to attend. The symposium is sponsored by the Surgery Study Section of the National Institutes of Health. Dr. Frederick A. Coller of the University of Michigan is chairman of the study section. Dr. Clause S. Beck of Western Reserve University is chairman of the committee making arrangements for the symposium.

MISCELLANEOUS

COURSES IN HAZARDS OF ATOMIC WARFARE

The U. S. Atomic Energy Commission, cooperating with the National Security Resources Board and the General Services Administration, will sponsor one-week "teacher-training" courses in the medical hazards of atomic warfare for selected representatives of the medical profession. The NSRB, the government agency responsible for civil defense planning, has assigned to the GSA the responsibility for planning in the field of wartime disaster relief. The AEC has been assigned the task of setting up training courses in the treatment of radiologic injuries among civilians as part of the program for wartime disaster relief planning.

The first of the courses will be held in March at the Argonne National Laboratory, Chicago; the Atomic Energy Project, University of Rochester, Rochester, N. Y., and Western Reserve University School of Medicine, Cleveland. Later in the spring, courses will be offered at the Atomic Energy Project, University of California, Los Angeles; the University of Utah School of Medicine, Salt Lake City; the University of Alabama School of Medicine, Birmingham, and Johns Hopkins School of Medicine, Baltimore.

The basic purpose of the courses is to provide information and materials to selected members of the medical profession who, in turn, will instruct physicians, dentists and nurses in local areas as part of state and municipal civil defense programs. Those attending the AEC-sponsored courses will be representatives of state medical societies, accredited medical schools and state and large city governments. Invitations to nominate representatives to the courses will be issued by the NSRB.

Plans for the courses were developed at a meeting of representatives of the AEC Division of Biology and Medicine, the NSRB and the interested universities and laboratories. Those who attended were:

Dr. Shields Warren, director, Division of Biology and Medicine, AEC.

Dr. Norvin C. Kiefer, director, Health Resources Division, NSRB.

Dr. Henry A. Blair, Atomic Energy Project, University of Rochester.

Dr. John Z. Bowers, deputy director, Division of Biology and Medicine, AEC.

Dr. Austin M. Brues, director, Biology Division, Argonne National Laboratory.

Dr. Charles L. Dunham, Division of Biology and Medicine, AEC.

Dr. Hymer L. Friedell, Department of Radiology, Western Reserve University School of Medicine, Cleveland.

Dr. R. V. Jager, associate professor of medicine, University of Utah, Salt Lake City.

Dr. Perrin H. Long, professor of preventive medicine, Johns Hopkins University School of Medicine, Baltimore.

Dr. William H. Riser Jr., professor of medicine, University of Alabama, Birmingham.

STATE GOVERNORS TO SELECT TECHNICIANS FOR TRAINING COURSES

The U. S. Atomic Energy Commission, in cooperation with the National Security Resources Board and the General Services Administration, will sponsor three five-week instructor training courses in radiologic monitoring technics for qualified educators and technicians selected by state governors.

The NSRB, the federal government agency responsible for civil defense planning, has assigned to the GSA the responsibility for planning in the field of wartime disaster relief. The AEC, in turn, has been requested to set up training courses in both radiologic monitoring technics and the treatment of radiologic injuries among civilians as part of the program for wartime disaster relief planning. Two of the three radiologic monitoring courses will be offered beginning March 13 at the Brookhaven National Laboratory, Upton, Long Island, and the Atomic Energy Project, University of California at Los Angeles. The third will be offered beginning April 3 at Oak Ridge, Tenn. As announced December 24, the training courses in the treatment of radiologic injuries will be given at seven institutions beginning in March.

The basic purpose of the radiologic monitoring courses will be to provide technical information to selected persons who have a background in the physical sciences as well as teaching experience, who in turn could instruct local science teachers in monitoring technics. It is expected that these local science teachers could then be utilized to teach monitoring teams as part of state and municipal civil defense activity.

Invitations to state governors to nominate representatives for the courses will be issued soon by the NSRB. There will be facilities to accommodate about 25 trainees in each course. If necessary, the courses will be repeated. Plans for the courses were developed by the AEC Division of Biology and Medicine in cooperation with representatives of the NSRB, the GSA and the three training centers.

CANADIAN-PRODUCED RADIOISOTOPES AVAILABLE

The U. S. Atomic Energy Commission announces that procedures have been developed that will enable qualified American applicants to obtain radioisotopes under the Canadian export program announced in Ottawa. Applications for Canadian-produced isotopes may be made to the Isotopes Division, U. S. Atomic Energy Commission, P. O. Box E, Oak Ridge, Tenn.

Dr. Kenneth S. Pitzer, director of the USAEC Research Division, who supervises the American isotope distribution program, said, "Radioisotopes produced in Canada will be especially useful to certain specialized research work, since the Chalk River, Ontario, reactor makes possible the production of some radioactive materials in higher concentrations than are available under the United States distribution program. The use of radioisotopes in these highly concentrated forms is of great value in certain types of research which are either impossible or very difficult when attempted with lower-activity material."

Applications from American importers desiring Canadian isotopes will be examined by the USAEC Isotopes Division on the same basis as applications for domestically produced materials, and applicants will be required to meet all the safety and health standards that have been in effect during the three years the United States program has been in operation. Information on how Canadian isotopes may be obtained is available from the Isotopes Division at Oak Ridge.

NEW RESEARCH PROPOSALS

The U. S. Atomic Energy Commission has approved 10 new research proposals in the field of biology and medicine, Dr. Shields Warren, director, Atomic Energy Commission Division of Biology and Medicine, announced Dec. 5, 1949. Approval of the proposals was recommended by the Atomic Energy Commission Advisory Committee on Biology and Medicine. Award of contracts to the 10 institutions involved will bring to a total of 160 the number of research projects supported by the Atomic Energy Commission which are now being carried on in medicine and biology at universities, hospitals and research centers. About $5,000,000 has been set aside for support of such research in non-Atomic Energy Commission agencies during the fiscal year 1950. The institutions submitting the newly approved proposals in medicine are:

1. University of Oregon Medical School (Dr. Frank B. Queen): "Evaluation of Body Content of Radium in Individuals with No Known Exposure."

2. Army Medical Center, Washington, D. C. (Major G. M. McDonnel, Lieut. Col. R. D. Maxwell and others): "Antibiotic Therapy in the Roentgen Irradiation Syndrome."

3. Sloan Kettering Institute (Dr. Rulon Rawson): "Physiologic Effects of Irradiation in Patients Receiving Large Doses of Iodine 131."

4. University of North Carolina (Dr. G. C. Kyker): "Tracer Studies and Irradiation in Dental Metabolism."

5. Memorial Hospital, New York City (Dr. Helen Woodward and Dr. C. P. Rhoads): "Measurement on Effects of Irradiation on Bone and Bone Phosphatase Activity."

6. University of Washington, Seattle (Drs. D. J. Hanahan, H. J. Daubon and R. Williams): "Synthesis of Carbon 14—Labeled Diethylstilbestrol and a Study of its Metabolism in the Body."

Medical News

(Physicians will confer a favor by sending for this department items of news of general interest: such as relate to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.)

CALIFORNIA

Doctors Meet with Chamber of Commerce.—Forty-five physicians in the Leimert Park area of Los Angeles held a meeting December 2 with the Crenshaw Chamber of Commerce. It was decided that monthly meetings of a like nature would be held, at which time current political problems and local problems of interest to the medical profession would be discussed. It was felt that by being associated with the local chamber of commerce the physicians will be able to acquaint the merchants of the area with their problems and at the same time be better able to learn more about the current problems of the community.

Dr. Kerr Honored.—The December 1949 issue of the *American Practitioner* constitutes a memorial volume in honor of Dr. William J. Kerr, professor of medicine, University of California Medical School, on the occasion of his sixtieth birthday. Contributions by members of the Division of Medicine of the University of California Medical School, of which Dr. Kerr is chairman, and by other friends and associates largely make up the December issue of the *American Practitioner*. Dr. Kerr was graduated from the University of California in 1912 and from Harvard Medical School, Boston, in 1915. After an internship at Massachusetts General Hospital he was appointed Travelling Fellow in Medical Research under the auspices of Harvard University, beginning his studies with Dr. George H. Whipple, director of the Hooper Foundation for Medical Research of the University of California Medical School. He has remained at the University of California, having been appointed associate professor in medicine in 1922 and chairman of the Division of Medicine in 1927. He is physician in chief of the University of California Hospital and consulting physician to the San Francisco Hospital. Dr. Kerr served during World War I as chief of the medical service of the base hospital at Camp Lewis, Washington. He was president of the American College of Physicians in 1938 and of the American Heart Association from 1937 to 1939, president of the American Rheumatism Society in 1937 and of the California Academy of Medicine in 1941. He was secretary of the Section on the Practice of Medicine at the American Medical Association from 1932 to 1935 and Chairman of the Section in 1936.

CONNECTICUT

Hartford Medical Society.—This society has arranged the following meeting programs. On February 6 Dr. J. William Hinton, New York, will present a clinic on "Indications and Contraindications for Gall Bladder Surgery." His evening address will be on "Massive Hemorrhage of the Upper Gastrointestinal Tract." On February 20 Dr. Perrin H. Long, Baltimore, will present a clinic on "The Abuses of Antibiotics." His evening address will be on "Current Uses of Antibiotics."

ILLINOIS

Seven New Waterworks.—During December 1949 the state department of public health issued approvals for proposed new waterworks in seven Illinois municipalities and for proposed improvements in the waterworks of nine cities. The plans and specifications for new waterworks include those for Hanna City, Peoria County; Fairmount and Fithian, Vermilion County; Hume and Brockton, Edgar County; Tower Hill, Shelby County, and Victoria, Knox County. The nine cities for which improvement plans were approved are: Mascoutah, St. Clair County; Rock Island, Rock Island County; Carlinville, Macoupin County; Port Byron and Cuba, Fulton County; Franklin Park, Cook County; Greenview, Menard County; Mt. Carmel, Wabash County, and Martinsville, Clark County.

Poliomyelitis Planning Committee.—The state director of public health on January 12 announced the formation of the Illinois State Polio Planning Committee, composed of members of all agencies dealing with diagnosis and treatment of this disease. This committee, formed at the request of Governor Stevenson, will coordinate the efforts of the various agencies and attempt to formulate procedures which will do away with duplication of services and enable patients to get more complete and earlier care. Members of the committee include Dr. Roland R. Cross, chairman; Dr. Harold M. Camp, Monmouth, secretary of the Illinois State Medical Society; A. Eugene Miller, Springfield, Illinois state relations officer of the American Red Cross; Dr. Herbert R. Kobes, Springfield, director of the state Division of Services for Crippled Children; Miss Ruth Kirk, Sterling, president of the Illinois State Nurses Association; Andy Glosecki, Springfield, Illinois state representative of the National Foundation for Infantile Paralysis; Leon Lyons, Chicago, president of the Illinois Hospital Association; Rodney H. Brandon, Chicago, chairman of the Sister Elizabeth Kenny Foundation; Miss Ann Prochazka, Chicago, secretary, Illinois Division of the American Physical Therapy Association, and Dr. Leonard M. Schuman, chief of the state division of communicable diseases.

Chicago

Dr. Sheehan Named Acting Dean.—The resignation of Dr. James J. Smith, dean of the Stritch School of Medicine of Loyola University, and the appointment of Dr. John F. Sheehan as acting dean were announced January 13. The new acting dean, who took office January 16, has been chairman of the pathology department since 1940. He joined Loyola's faculty in 1937 after teaching at Holy Cross College, Worcester, Mass., Georgetown University, Washington, D. C., and Tufts College Medical School, Boston. A native of Manchester, N. H., he received his M.D. degree from Georgetown University School of Medicine, Washington, D. C., in 1933. He served his residency in pathology at the Mallory Institute of Pathology, Boston City Hospital.

Necropsies in Chicago Area Hospitals.—The Institute of Medicine of Chicago in its annual report stated that in 1948 8,266 necropsies were performed in 66 Chicago hospitals reporting 593,635 admissions and 21,304 deaths. The percentage of permission necropsies in 1948 for all reporting hospitals was 42.4. Twenty-nine years ago 36 hospitals reported 7,934 deaths and 789 permission necropsies. The increase in necropsies reflects the greater interest of the hospital staffs in improvement of the quality of diagnosis and treatment of patients. Among many other factors which have contributed to the increase have been the better understanding by the public of the desirability of necropsies, the better cooperation between physicians and undertakers and the improved technic of pathologists. Special mention should be made of the excellent percentages of necropsies: Lewis Memorial Maternity Hospital, 100; Research and Educational Hospitals, 93.4; Children's Memorial Hospital, 90.8; Evanston Hospital, 87.1, and Municipal Contagious Disease Hospital, 85.5. The percentage of permission necropsies in reporting hospitals, omitting Cook County Hospital, has grown slowly from 11.4 in 1919 to 50.4 in 1948. In 1919 there was only 1 hospital with as high a percentage as 48.4 and 5 from 20 to 25, while in 1948 there were 26 hospitals with percentages of 50 or over, 30 with percentages from 30 to 49, 8 with percentages from 20 to 29 and 1 with a percentage below 10.

MASSACHUSETTS

Personal.—Dr. William H. Turville, Revere, has been named epidemiologist of the Division of Tuberculosis of the Massachusetts Department of Public Health. He is a retired veteran with 32 years' service in the U. S. Navy Medical Corps.

Research on Diseases of Old Age.—Ground was broken December 29 on property of the Massachusetts General Hospital, Boston, for a new $2,750,000 research building dedicated to the investigation of the diseases of old age. It will have six stories and a penthouse.

Anna Freud to Speak on Genetic Psychology.—Anna Freud of London, daughter of the late Sigmund Freud, will speak in Atwood Hall, Clark University, Worcester, April 20 at 8 p. m. in connection with the university's sixtieth anniversary program. She will be one of the speakers in a symposium on genetic psychology. Miss Freud has been lecturing at the Psychoanalytic Institute in London since 1938. She founded a rest center for bombed-out children during the war and has written two books regarding this work, "War and Children" and "Infants Without Families."

NEW YORK

Vander Veer Lecture in Surgery.—The first annual lecture in honor of the late Dr. Albert A. Vander Veer Sr., former professor of surgery, Albany Medical College, Albany, was given January 26 at the college under the sponsorship of the Nu Sigma Nu medical fraternity. Dr. Edward D. Churchill, John Homans professor of surgery, Harvard Medical School, Boston, and surgeon in chief, Massachusetts General Hospital, Boston, spoke on "The Lung."

Study of Q Fever.—The New York State Department of Health reports that an isolated outbreak of Q fever which occurred in Syracuse last September is the first recognized outbreak in the state. Two employees of an industrial plant employing 135 persons showed symptoms of the disease. Representatives from the College of Medicine, Syracuse University, the New York State Department of Health and the Syracuse Department of Health are cooperating in a study of the local outbreak. The rendering establishment, at which infected employees worked, draws its animal products from central New York.

Personals.—Dr. MacNaughton Wilkinson resigned as chief of obstetrics at the Rochester General Hospital on December 1 and requested transfer to the consulting staff. Dr. Eugene R. Duggan, Rochester, has been appointed to fill the unexpired term of Dr. Wilkinson.——Dr. Isaac N. Wolfson, assistant director of Manhattan State Hospital on Ward's Island since 1943, will become director of Newark State School, February 1. The school is one of six state institutions for mental defectives. Dr. Wolfson is now associate consultant psychiatrist of Columbia University Psychoanalytic Clinic for Training and Research at the hospital and since 1944 has been associate in clinical psychiatry at the New York Medical College, Flower and Fifth Avenue Hospitals. He graduated from Syracuse University College of Medicine in 1922.

New York City

Grant to Cerebral Palsy Clinic.—The Cerebral Palsy Society of New York City on December 28 presented $5,000 to the cerebral palsy division of Vanderbilt Clinic of the Columbia-Presbyterian Medical Center. This money has been earmarked for medical supervision, administration and speech therapy. The check is the second annual contribution that the society has given the hospital to be used for support of the pediatric Cerebral Palsy Clinic, where over 120 cerebral palsy patients are given routine examinations and therapy. Patients who require transportation to the clinic are brought here by the Association for the Aid of Crippled Children. Patients requiring home treatments are visited regularly by both the association and the Brooklyn Visiting Nurse Association. In addition to serving as a clinic for patients, it is a model for training the occupational and physical therapy students of Columbia University. The Cerebral Palsy Society of New York City, 5th Avenue and 103rd Street, has made contributions of over $85,000 in the last two years for research, treatment, rehabilitation and the establishment of new treatment centers.

Dr. Mahoney to Direct Bureau of Laboratories.—Dr. John Friend Mahoney on December 27 became director of the Bureau of Laboratories of the New York City Department of Health. He served as director of the Venereal Disease Research Laboratory, U. S. Public Health Service, from 1929 to his retirement from the service a few weeks ago. He received his M.D. degree from Marquette University School of Medicine, Milwaukee, in 1914 and served in the Milwaukee County Hospital and the Chicago Lying-In Hospital. He is chairman of the Committee of Experts on the Venereal Diseases, World Health Organization; chairman of the National Advisory Serology Council; chairman of the Committee for Standardization of Serologic Tests for Syphilis, American Public Health Association, and member of the Syphilis Study Section, National Institutes of Health. Dr. Mahoney also has served as associate professor in clinical syphilology and dermatology, New York University, and as lecturer in dermatology at Columbia University.

Open Ambulatory Clinic at Bellevue.—A new type of clinic for ambulatory patients at Bellevue Hospital, which will make available to the indigent sick comprehensive, diagnostic and general medical care, was opened January 10. The patients of the new clinic will have appointments with their doctors and will be seen in private. The clinic's staff will comprise a complete medical and surgical team, including senior surgeons, physicians and other specialists from the New York University Post Graduate Medical School faculty, and when in full operation the clinic will be open all day, five days a week. The clinic includes 67 examination rooms, laboratories and small operating rooms, all of which have been newly decorated and reequipped. "This new clinic at Bellevue," the city commissioner of hospitals said, "is an important step in the department of hospitals' program for revitalizing its outpatient departments and serves as a link between our home care service and ward care in our hospitals." The new unit, to be known as the Bellevue Hospital Fourth Division (N. Y. U.) Ambulatory Clinic, will be jointly directed by Dr. Charles F. Wilkinson, assistant professor of internal medicine and director of the Fourth Medical Division, and Dr. J. William Hinton, professor of surgery and director of the Fourth Surgical Division. In addition to general medical and surgical care, the new Ambulatory Clinic will provide services under the direction of leading specialists for patients requiring special care because of heart conditions, allergies, diabetes and other ailments. Patients will be admitted to the new clinic through the regular admitting procedures of Bellevue Hospital.

NORTH CAROLINA

Society News.—At the annual dinner of the Wake County Medical Society at Raleigh, December 22, Dr. George F. Lull, secretary and general manager of the American Medical Association, Chicago, spoke on "Modern Trends in American Medicine."

Watts Hospital Symposium.—The seventh annual Watts Hospital Medical and Surgical Symposium will be conducted in the Watts Hospital and Carolina Theater in Durham February 15-16. The following out of town physicians will participate in the program: M. Edward Davis, Chicago; T. Hale Ham, Donald S. King, Robert R. Linton, Richard H. Overholt, Merrill C. Sosman and Shields Warren, all of Boston; Russell L. Haden, Crozet, Va.; William Parson and Byrd S. Leavell, Charlottesville, Va.; I. Mims Gage, New Orleans, and Malcolm B. Dockerty, Rochester, Minn.

PENNSYLVANIA

Cancer Research Center.—At the dedication of the new $2,000,000 state institute for cancer research at Fox Chase, Pa., Charles F. Kettering, Sc.D., General Motors vice president in charge of research, was the principal speaker. Most of the funds for the buildings, which are on the grounds of the Jeanes Hospital, Philadelphia, were contributed by the Pew family. H. Howard Pew is chairman of the institute's board of directors. The research staff is under the direction of Dr. Stanley P. Reimann, who for many years was head of the Lankenau Hospital Cancer Research Institute in Philadelphia. Nearly 100 workers will conduct the basic research to be done at the institute.

Pittsburgh

Conference on Relation of Psychology to Medicine.—The annual conference on Current Trends in Psychology in relation of psychology to medicine will be presented by the University of Pittsburgh February 9-10. Visiting speakers include:

Robert H. Felix, Washington, D. C., Psychology in Public Health.
Carlyle F. Jacobsen, Ph.D., Iowa City, Psychology in Medical Education.
Paul E. Huston, Iowa City, Psychology in Relation to Psychiatry.
Nathan W. Shock, Ph.D., Bethesda, Md., Psychology and Gerontology.
Mr. Hans J. Eysenck, London, England, Psychology and Medicine in Great Britain.

Psychosomatic Seminars.—Eleven seminars on psychosomatic medicine are being presented jointly by the Staunton Clinic of the University of Pittsburgh and the Extension School of the University of Philadelphia Psychoanalytic Institute. Seminars will be held weekly in the Auditorium of Western Psychiatric Institute on Wednesdays from 8 to 10 p. m. Each lecture is followed by a discussion. The remaining lectures are as follows:

Feb. 1, Dr. Tryphena Humphrey, Pittsburgh, Neuroanatomical Basis of Behavior.
Feb. 8, Ralph N. Zabarenko, Pittsburgh, Physiologic Basis of Behavior.
Feb. 15, James T. McLaughlin, Pittsburgh, Skin Disorders.
Feb. 22, Edward J. Carroll, Pittsburgh, Disorders of the Upper Gastrointestinal Tract.
March 1, Dr. Carroll, Disorders of the Lower Gastrointestinal Tract.
March 8, Lucy Schnurer, Pittsburgh, Endocrine and Metabolic Disorders.
March 15, Dr. Zabarenko, Cardiovascular Disorders.
March 22, Dr. McLaughlin, Arthritis.
March 29, Dr. Schnurer, Respiratory Disorders.
April 5, Dr. McLaughlin, Headache, Migraine and Epilepsy.

Registration fee for the series is $10, and $1 for individual lectures. Inquiries may be addressed to Dr. James T. McLaughlin, Staunton Clinic, University of Pittsburgh.

TENNESSEE

Hospital for Children.—A 100 bed Children's Hospital will be built in Memphis as a voluntary, nonprofit institution, primarily for chronically ill children. The hospital will provide equipment and facilities for advanced therapy not now available in Memphis. The federal government will furnish 52 per cent of the cost and the state of Tennessee 24 per cent; the remaining $448,800 will be raised locally by public solicitation. To date $240,000 has been contributed. The University of Tennessee medical units in Memphis purchased the land, which is adjacent to the hospitals included in the medical center, from the City of Memphis and will aid in its operation.

TEXAS

Program on Arthritis Therapy.—The Texas Rheumatism Association will hold its annual meeting at the Blackstone Hotel in Fort Worth on February 6. Included in the program will be a symposium on steroid and ACTH therapy in rheumatoid arthritis.

VIRGINIA

Drs. Mann and Pembleton Made Department Heads.—The Medical College of Virginia, Richmond, reports that Dr. Geoffrey T. Mann, acting head of the department of legal medicine, has been promoted to associate professor and head of the department. Dr. Mann was graduated at the University of Manitoba Faculty of Medicine, Winnipeg, in 1948. Dr. William E. Pembleton, acting head of the department of anesthesiology, has been promoted to professor and head of the department. He was graduated at the University of Pennsylvania School of Medicine, Philadelphia, 1937.

WEST VIRGINIA

Brothers Have Parallel Careers.—For the first time in the history of the West Virginia State Medical Association, so far as the records disclose, two members who are brothers have been elected president of separate component societies to serve during the same period of time. Dr. John F. McCuskey of Clarksburg became president of the Harrison County Medical Society January 1, and on the same date his brother, Dr. Paul L. McCuskey, Parkersburg, assumed office as president of the Parkersburg Academy of Medicine. Each will serve during 1950. Both served in the 106th Station Hospital overseas during World War II. Each doctor is a urologist, and both obtained part of their academic education at Wesleyan College. Each received his M.D. degree at Northwestern University Medical School, Chicago. Both have been active in the public relations work of the state medical association.

WISCONSIN

Dr. Stratton Made Professor Emeritus.—Requesting that he be relieved of active teaching duties in order to devote full time to private practice, Dr. Frederick A. Stratton, Milwaukee, a volunteer teacher for 43 years and director of the department of general surgery in the Marquette University School of Medicine, Milwaukee, has been awarded the honorary title of professor emeritus.

Gift for Cancer Research.—University of Wisconsin regents have accepted a $30,000 gift from the Alexander and Margaret Stewart trust for cancer research in the university's McArdle Memorial Laboratory. Alexander Stewart was prominent many years ago in lumbering activities in the Wausau area. Margaret Stewart, his daughter, who died in 1946, directed that the income from her estate be used to help fight cancer.

GENERAL

Physicians' Art Exhibit.—The American Physicians Art Association will hold its annual art exhibition in the San Francisco Civic Auditorium, June 26-30, during the annual session of the American Medical Association. Physician-artists from South and Central America and the Philippines and Hawaii as well as Canada and the United States are expected to exhibit. For shipping labels, entry blanks and further information write the Executive Secretary, F. H. Redewill, M.D., 526 Flood Bldg., San Francisco 2.

Allergists' Annual Meeting.—The Southeastern Allergy Association will meet at the Columbia Hotel, Columbia, S. C., February 11-12, under the presidency of Dr. Oscar Swineford Jr., Charlottesville, Va. A panel discussion on pediatric allergy will be presented Saturday morning and one on office procedure on Sunday morning. Among the physicians presenting papers are Drs. Theodore L. Squier, Milwaukee, Wis., president-elect of the American Academy of Allergy, and Dr. John H. Mitchell, Columbus, Ohio, president-elect of the American College of Allergists. The banquet will be held at 7 p. m.

Thirty-Four Scientists to Receive Research Awards.—Research awards totaling $140,000 have been allocated by the American Heart Association to 34 investigators, the first to be made from funds contributed by the American public during the 1949 heart campaign last February. The 1950 campaign, during the coming month of February, will have a goal of $6,000,000 for a program that includes continued research in the field of heart and blood vessel diseases. Of the 34 scientists named, two receive five year grants as established investigators engaged in independent research, while 32 will be research fellows chosen on a one year basis to conduct research under a mentor in hospital or medical school laboratories.

Annual Meeting of Orthopedic Surgeons.—The American Academy of Orthopaedic Surgeons will hold its annual meeting February 11-16 at the Waldorf-Astoria, New York. The first two and a half days of the program will be devoted to an audiovisual education program and instructional courses. Physicians presenting papers by invitation include:

William K. Massie Jr., New York, Vascular Epiphyseal Changes in Congenital Dislocation of Hip.
Hart E. Van Riper, New York, Medical Care Program of the National Foundation for Infantile Paralysis.
Joseph H. Boyes, Los Angeles, Flexor Tendon Grafts in Fingers and Thumb.

The presidential address will be given Tuesday morning by Dr. Mather Cleveland, New York.

Subscriptions Needed for Mental Health Bulletin.—*The Bulletin of the World Federation for Mental Health*, authorized in 1948 by the International Congress on Mental Health meeting in London, is in need of 1,200 subscribers to reach a self supporting basis in the English edition. Subscriptions beyond the 2,000 mark will enable the federation to issue a second edition in French. Annual subscription is $1, which should be mailed directly to the World Federation for Mental Health, 19 Manchester Street, London W. 1, England. The bulletin, published every two months, was first issued in February 1949. It is intended to serve as a link between the federation and its member associations in different parts of the world as well as a form for the exchange of ideas and information. Each issue carries at least one original article; space will also be provided for news from member associations and the federation.

Increase in Influenza Cases Reported.—The U. S. Public Health Service's report for the week ending January 7 shows increases for influenza cases in all geographic divisions except New England. The largest increase occurred in the West South Central Division (from 1,738 to 2,653), which is comprised of four states, Texas, Arkansas, Louisiana and Oklahoma. Texas reported an increase of 959 cases; the next largest increases in influenza cases were in Virginia (from 288 to 513), Alabama (from 39 to 188), Arizona (from 93 to 123), Colorado (from 9 to 54), Georgia (from 166 to 202) and Florida (from 2 to 24). Hawaii reported 484 influenza cases for the week. Texas reported also an increase in reported cases of pneumonia from 323 to 532. Virginia showed an increase in pneumonia from 58 to 158 cases and Georgia from 21 to 123. These figures are based on preliminary reports by telegraph from state health officers.

General Practitioners' Meeting.—The American Academy of General Practice will hold its annual assembly in Kiel Auditorium, St. Louis, February 20-24, under the presidency of Dr. Elmer C. Texter, Detroit. The following physicians will speak on the program, which begins Monday noon:

Irving S. Wright, New York
Elliott P. Joslin, Boston
Henry L. Bockus, Philadelphia
Arthur C. Curtis, Ann Arbor, Mich.
Robert M. Zollinger, Columbus, Ohio
Euclid M. Smith, Hot Springs, Ark.
Frank W. Hall, Cape Girardeau, Mo.
Clarence E. de la Chapelle, New York
Edward H. Hashinger, Kansas City, Mo.
Walter J. Reich, Chicago
Wendell G. Scott, St. Louis
C. Charles Burlingame, Hartford, Conn.
Robert N. Buchanan Jr., Nashville, Tenn.
Stevens J. Martin, Hartford, Conn.
Paul B. Beeson, Atlanta, Ga.
Charles J. Weigel, River Forest, Ill.
Eugene M. Regen, Nashville, Tenn.
David A. Boyd Jr., Rochester, Minn.
Howard A. Rusk, New York
Rutherford Gradwohl, St. Louis
Edwin C. Hamblen, Durham, N. C.
Phillip Thorek, Chicago

The Foundation Prize.—The award of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, known as the Foundation Prize and consisting of $200, is available. Eligible are interns, residents or graduate students in obstetrics, gynecology or abdominal surgery and persons with an M.D. degree or a scientific degree, approved by the Prize Award Committee, who are actively practicing or teaching obstetrics or engaged in research in these fields. Manuscripts must be limited to 5,000 words. Three typewritten copies should be presented under a *nom de plum*, which shall in no way indicate the author's identity. Manuscripts must be in the hands of the secretary before June 1. A Committee on Awards, appointed

by the president, will determine the successful contestant, and the award will be made at the annual meeting of the association, at which time the winning paper must be read by the author as a part of the regular scientific program.

Papers for the International Heart Congress.—It has been decided by the International Cardiac Council that titles and summaries (not exceeding 300 words) of papers offered for presentation at the First International Heart Congress in Paris September 3-9 should be sent to the secretary of each applicant's national heart association throughout the world. A committee of the American Heart Association has been established to select the most suitable communications from the United States to be forwarded to the Inter American Cardiac Committee and thence to the headquarters in Paris, where final selection will be made. It is expected that 400 to 500 papers may be read at the meeting in Paris and that half of these will be allocated to the Western Hemisphere. Each communication is to take not over ten minutes as a rule, followed by a five minute discussion period. Titles and summaries should be in the hands of Dr. Charles A. R. Connor, medical director, American Heart Association, 1775 Broadway, New York, by March 1.

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Leslie B. Hohman, Durham, N. C., Principles of Behavioristic Training in Cerebral Palsy.
Mr. Alfred Strauss, Racine, Wis., Educational Approach in Cerebral Palsy.
Winthrop Phelps, Baltimore, Bracing.
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Albert B. Sabin, Cincinnati, Diagnostic Methods for Evaluating Role of Toxoplasmosis in Cerebral Palsy.

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Joseph Stephen Derrick, Los Angeles; Tufts College Medical School, Boston, 1907; member of the American Medical Association; affiliated with St. Vincent's Hospital; died November 16, aged 67, of heart disease.

George Bennett Faber, Bexley, Ohio; University of Louisville (Ky.) School of Medicine, 1921; served during World War I; formerly associated with the Ohio Industrial Commission in Columbus; died in Mount Carmel Hospital, Columbus, November 14, aged 62, of hypertension, arteriosclerosis and cerebral thrombosis.

Owen Price Farrington, Alliance, Neb.; Marion-Sims College of Medicine, St. Louis, 1892; Jefferson Medical College of Philadelphia, 1895; died November 27, aged 81, of uremia.

Leroy R. Fast, Paulding, Ohio; National Normal University College of Medicine, Lebanon, 1891; Barnes Medical College, St. Louis, 1898; member of the American Medical Association; served overseas during World War I; died in Payne November 24, aged 82.

Stanford William Fennemore ● Price, Utah; Northwestern University Medical School, Chicago, 1933; served during World War II; died November 12, aged 44, of coronary occlusion.

Robert Altha Gans ● Poland Mines, Pa.; Cleveland Homeopathic Medical College, 1905; died in Wenatchee, Wash., November 30, aged 70.

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William Augustine Connolly, Rochester, N. Y.; University of Rochester School of Medicine and Dentistry, 1936; member of the American Medical Association; served during World War II; assistant medical superintendent of the Hawk Eye Works of the Eastman Kodak Company; died November 26, aged 40, of myocardial infarction.

Carmine John Cufari ● Union City, N. J.; Marquette University School of Medicine, Milwaukee, 1940; on the staff of North Hudson Hospital, Weehawken; died in the Jersey City Medical Center, Jersey City, November 15, aged 43, of congestive heart failure.

Joseph Stephen Derrick, Los Angeles; Tufts College Medical School, Boston, 1907; member of the American Medical Association; affiliated with St. Vincent's Hospital; died November 16, aged 67, of heart disease.

George Bennett Faber, Bexley, Ohio; University of Louisville (Ky.) School of Medicine, 1921; served during World War I; formerly associated with the Ohio Industrial Commission in Columbus; died in Mount Carmel Hospital, Columbus, November 14, aged 62, of hypertension, arteriosclerosis and cerebral thrombosis.

Owen Price Farrington, Alliance, Neb.; Marion-Sims College of Medicine, St. Louis, 1892; Jefferson Medical College of Philadelphia, 1895; died November 27, aged 81, of uremia.

Leroy R. Fast, Paulding, Ohio; National Normal University College of Medicine, Lebanon, 1891; Barnes Medical College, St. Louis, 1898; member of the American Medical Association; served overseas during World War I; died in Payne November 24, aged 82.

Stanford William Fennemore ● Price, Utah; Northwestern University Medical School, Chicago, 1933; served during World War II; died November 12, aged 44, of coronary occlusion.

Robert Altha Gans ● Poland Mines, Pa.; Cleveland Homeopathic Medical College, 1905; died in Wenatchee, Wash., November 30, aged 70.

Caroline Lilla Garlock, Canajoharie, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896; affiliated with Amsterdam (N. Y.) City Hospital; died November 26, aged 82, of coronary occlusion.

Albert G. Girard, Detroit; Western University Faculty of Medicine, London, Ontario, Canada, 1907; died October 23, aged 65, of coronary thrombosis.

Elmer J. Griffin, Omaha; John A. Creighton Medical College, Omaha, 1904; died November 15, aged 74.

William Edwin Ground ● Superior, Wis.; Missouri Medical College, St. Louis, 1881; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; on the staff of St. Mary's Hospital, where he died November 29, aged 88, of chronic myocarditis and mitral stenosis.

Theron W. Hammond, Grand Rapids, Mich.; Detroit College of Medicine, 1896; member of the American Medical Association; served as chief at the Michigan Soldiers' Home Hospital; died October 9, aged 82, of cerebral thrombosis.

Sterling Perry Hart, Auburn, Ill.; Rush Medical College, Chicago, 1900; member of the American Medical Association; died suddenly October 1, aged 73, of arteriosclerosis.

Emory Edward Holland ● Richmond, Ind.; Indiana University School of Medicine, Indianapolis, 1909; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; ophthalmologist for the state department of public welfare; affiliated with Reid Memorial Hospital; died October 13, aged 65, of carcinoma of the larynx.

Emory Lee Jewell, Shoshoni, Wyo.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1903; past president of the Wyoming State Medical Society; member of the American Medical Association; in June 1949 received an honorary LL.D. degree from the University of Wyoming; died October 21, aged 74, of cardiac decompensation.

Frank Leslie Johnson, Livermore, Ky.; Eclectic Medical Institute, Cincinnati, 1905; member of the American Medical Association; past president of McLean County Medical Society; served as a member of the state board of health; past president of county board of education and city school board; affiliated with the Owensboro (Ky.) Daviess County Hospital, where he died October 8, aged 73, of acute coronary thrombosis.

James Clarence Johnson ● Atlanta, Ga.; Atlanta Medical College, 1887; member of the American Gastro-Enterological Association; died November 7, aged 83, of cerebral hemorrhage.

Joseph Hadleigh Johnson, Grant, Neb.; the Hahnemann Medical College and Hospital, Chicago, 1910; served during World War I; died in the Veterans Administration Hospital in Cheyenne, Wyo., October 18, aged 68.

Peter William Kassett ● Lynn, Mass.; Tufts College Medical School, Boston, 1927; member of the American Association of Industrial Physicians and Surgeons; affiliated with the Salem (Mass.) Hospital; on the staffs of Union Hospital and Lynn Hospital, where he died November 23, aged 46, of duodenal ulcer following subtotal gastrectomy.

John H. Kay, Hot Springs National Park, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1905; served during World War I; died October 27, aged 66.

Helen Lee ● San Jose, Calif.; University of Michigan Homeopathic Medical School, Ann Arbor, 1905; died October 28, aged 69.

Ara Brooks Libby ● Gardiner, Me.; Medical School of Maine, Portland, 1899; affiliated with Gardiner General Hospital; died November 19, aged 80, of arteriosclerosis.

Eaton Shaw Lothrop ● Portland, Maine; Boston University School of Medicine, 1925; served during World War I and II; past city physician of Portland and town physician of Cape Elizabeth; fellow of the American College of Surgeons; affiliated with Children's Hospital, Mercy Hospital, Maine Eye and Ear Infirmary and Maine General Hospital, where he died November 23, aged 49, of dissecting aneurysm.

William Leander McClure, Yakima, Wash.; Northwestern University Medical School, Chicago, 1909; fellow of the American College of Surgeons; past president of Yakima County Medical Society; served overseas during World War I; affiliated with St. Elizabeth Hospital; died October 7, aged 68, of acute myelogenous leukemia.

Clarence Philip Obenschain, Staunton, Va.; University College of Medicine, Richmond, 1904; served during World War I; formerly county coroner; affiliated with Kings Daughters Hospital; died November 29, aged 71, of coronary occlusion.

Henry Monteith Porter, Dayton, Ohio; Meharry Medical College, Nashville, Tenn., 1894; died November 17, aged 77.

A. Madison Puckett, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; died November 27, aged 59.

Joe Sephus Reynolds, Knoxville, Tenn.; University of Tennessee Medical Department, Nashville, 1925; member of the American Medical Association; died in November, aged 50.

Sidney Gilbert Sarratt, Union, S. C.; University of Maryland School of Medicine, Baltimore, 1897; member of the American Medical Association; served during World War I; died in Veterans Administration Hospital, Columbia, November 22, aged 74, of bronchopneumonia and cerebral arteriosclerosis.

John Cleveland Schroeder, Milwaukee; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; on the staff of Deaconess Hospital; died November 18, aged 75, of rheumatic heart disease.

Hiram Chinsworth Scott ● Waynesburg, Pa.; Jefferson Medical College of Philadelphia, 1903; veteran of the Spanish-American War; died in Mercy Hospital December 13, aged 74.

John Stewart Shaw Jr., Wilmington, Del.; University of Rochester School of Medicine and Dentistry, 1940; certified by the National Board of Medical Examiners; died in Bellevue Hospital, New York, November 21, aged 36, of pulmonary embolism.

Warren Shepherd, Salt Lake City; Jefferson Medical College of Philadelphia, 1910; member of the American Medical Association; at one time mayor of Beaver; past president of the staff of Latter-Day Saints Hospital; served on the staff of St. Mark's Hospital; for a time city physician; died in Camas, Wash., November 29, aged 69, of coronary artery disease.

Arthur Morrison Sherman, Gresham, Ore.; Rush Medical College, Chicago, 1895; died in Portland November 5, aged 80.

Addison Whittaker Smith, Fort Madison, Iowa; Jefferson Medical College of Philadelphia, 1891; member of the American Medical Association and the Medical Society of the State of Pennsylvania; died November 9, aged 82, of coronary occlusion.

Alfred Parker Smith ● Winchester, Tenn.; University of Tennessee College of Medicine, Memphis, 1930; died November 21, aged 47, of heart disease.

Albert Ferdinand Soch ● Fredonia, N. Y.; University of Buffalo School of Medicine, 1897; since 1934 health officer of the town of Pomfret, Chautauqua County; died in Buffalo (N. Y.) General Hospital October 30, aged 78, of carcinoma of the bladder.

Charles Bane Spates, Des Moines, Iowa; Omaha (Neb.) Medical College, 1896; died in Iowa Methodist Hospital November 24, aged 84, of myocardial degeneration.

Allan Edgar Stewart ● Chicago; Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1898; an Associate Fellow of the American Medical Association; served on the staff of Loretto Hospital; died in La Jolla, Calif., November 30, aged 76.

James Rodman Stites, Louisville, Ky.; University of Louisville School of Medicine, 1925; member of the American Medical Association; served during World Wars I and II; died in Kentucky Baptist Hospital November 5, aged 51, of myocardial failure.

William Stone ● New York; University and Bellevue Hospital Medical College, New York, 1900; affiliated with Sydenham Hospital and New York Polyclinic; died in Harkness Pavillion, New York Medical Center, November 18, aged 71, of mediastinal tumor.

John Joseph Sullivan ● Boston; Harvard Medical School, Boston, 1900; an Associate Fellow of the American Medical Association; affiliated with St. Elizabeth's Hospital; died December 9, aged 80.

Victor Thaddaeus Sullivan, Wilmington, N. C.; Medical College of Virginia, Richmond, 1931; interned at the James Walker Memorial Hospital; served during World War II; lieutenant colonel, medical reserve corps of the U. S. Army; died in Batavia, Java, November 19, aged 44.

James Hickman Swan ● Painesville, Ohio; Northwestern University Medical School, Chicago, 1923; died in Lake County Memorial Hospital November 23, aged 59, of cerebral hemorrhage.

Arthur Clyde Thorpe, Los Angeles; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; member of the American Medical Association; served during World War I; died November 9, aged 82.

Manuel J. Urrea, México D. F., Mexico; Universidad de Guadalajara Facultad de Medicina, Mexico, 1901; died November 11, aged 76.

John W. Van Noy, Dodd City, Texas; University of Tennessee Medical Department, Nashville, 1891; died in the Allen Memorial Hospital, Bonham, December 9, aged 80.

Foreign Letters

DENMARK

(From a Regular Correspondent)

COPENHAGEN, Dec. 21, 1949.

Health of Greenlanders

In the spring of 1949 the Danish Red Cross Society sent Dr. Kai Ludvigsen to Greenland to report on conditions with a view to securing effective Red Cross aid from the mother country. Dr. Ludvigsen had already spent eight years, 1930 to 1939, in Greenland, and he was able to use his earlier experience to form an opinion of the present state of hygiene in the country. His report, part of which is published in a recent number of the Danish Red Cross magazine, is disappointing in that he has found little improvement since he was in Greenland ten years ago. The Greenlander of today earns money from fishing and raising sheep, but he has not yet learned to spend his earnings wisely. Many houses of wood have sprung up in the past decade, but they continue to be as small and of as poor quality as ever. His clothing also is still poor, and, though the shops contain more for sale, the increased turnover of candy and alcohol is significant.

Dr. Ludvigsen made several recommendations. The Greenlanders need and would appreciate good literature, primarily educational works on hygiene and allied social problems, including nursing. At least three new homes are needed for orphans, who seem to abound in Greenland. In one district with a population under 1,800, there were as many as 71 orphans. The lot of an orphan is singularly difficult in Greenland, and it would be well if the three homes proposed could care for 10 to 15 orphans up to the age of 15. There is also the problem of the aged, which until lately families often solved by putting them out of the house to die of cold and starvation, a fate to which they were sometimes quite resigned. As for rheumatic patients, he suggested that the Island of Unartok, with its warm springs of 37 to 38 C., should be exploited for their benefit. Here again the Red Cross could do much at a reasonable cost by building a recreation home in which the rheumatic Greenlander could spend the summer months.

Neuroses

The Danish Medical Association has adopted the practice of dealing at each annual meeting with some particular subject of wider and more general social interest than ethical or administrative problems. At its last annual meeting it devoted much time to a discussion of a report drawn up by a committee of experts invited to study and make proposals about the much vexed problem of neuroses and how to deal with them. The members of this committee, recruited from many different sources, including hospital and general practice, had succeeded in preparing a report on which all were unanimous. Their plan of campaign is remarkably comprehensive. They have agreed that in most cases ambulatory treatment will suffice and that the general practitioner, the psychiatrist and a neurosis station with, if need be, a few beds at its disposal, should form a team. There must be more and better teaching of psychiatry for the medical student and for the postgraduate. Study groups of only five or six doctors, one of whom has made a special study of psychiatry, are much recommended. It is not anticipated that psychoanalysis will be needed to any great extent in the new scheme.

Several speakers at this meeting drew attention to the revolutionary character of the present trend from somatic to psychosomatic medicine. One speaker recalled a recent discussion of a case of trichobezoar. A somatically minded radiologist had explained how he located a ball of hair in the stomach, and a somatically minded surgeon had explained how to operate in such a case. It was then that a psychosomatically minded doctor had timidly ventured the question, Why did she swallow hairs? His colleagues evidently discerned what was in his mind, for they hastened to assure him that the patient did not look at all neurotic. At the same meeting of the Danish Medical Association, Professor Jacobsen, of the Aarhus Hospital, told how he had arranged for a psychiatrist to make a special examination of 500 consecutive patients admitted to this general hospital. About half the women and a third of the men were found to be psychologically not normal.

Electrocardiographic Study of Untreated Hypertension

There seem to be still several unanswered questions with regard to the prognosis of patients with high blood pressure with disquieting electrocardiograms. What happens to such patients when left to themselves? What does dietetic treatment promise? And when is sympathectomy indicated? Dr. P. Bechgaard of Aarhus and of the Rigshospital in Copenhagen has sought an answer to the first of these questions by a follow-up study of 264 patients with untreated hypertension kept under observation four to eleven years. All these patients were under the age of 60, i. e., young enough to be considered for sympathectomy. All of them underwent electrocardiographic examination at both the beginning and the end of the observation period, and several were also examined in the interval. Two thirds of the patients were women.

Among the 264 patients were 162 with normal electrocardiograms at the beginning and end of the observation period. There were 48 patients with a normal electrocardiogram at the first examination and an electrocardiogram indicative of disease of the myocardium at the second examination. There were also 45 patients with pathologic electrocardiograms at both the beginning and end of the observation period. There were only 9 patients whose electrocardiograms were less pathologic at the last than at the first examination. Indeed, there were only 3 of these 9 patients of whom it could be definitely said that the electrocardiogram was much better. As all the patients dying during the observation period were not included in this study, the findings are even less encouraging than the above figures would suggest.

Dr. Bechgaard concludes that, once an electrocardiographic examination has shown definite pathologic changes in the subjects of hypertension, there is little prospect of improvement in this direction unless the condition is acute, as in coronary thrombosis. Of course, it is possible that dietetic treatment and sympathectomy may improve the outlook in such cases, and mere rest in bed may also do so. But this study demonstrates the fallacy of a wait-and-see policy.

ITALY

(From a Regular Correspondent)

FLORENCE, Nov. 28, 1949.

Treatment of Pulmonary Abscess

Treatment of pulmonary abscess was discussed during the "Medical Days" in Verona, and many doctors took part in the discussion. Professor Ceccarelli, director of the Surgical Clinic of the University of Padua, said that pulmonary abscess heals spontaneously or with medical treatment in 20 to 50 per cent of the cases. Not all patients with pulmonary abscess should, therefore, be sent to the surgeon at once; on the contrary, initial adequate medical treatment is obligatory. Only the gangrenous form represents an exception to this rule, and it requires medical combined with immediate surgical treatment. The usefulness of the antibiotics for medical treatment must be taken into account particularly when they may be used locally, according to the custom of introducing the drug through the trachea or the lobar bronchus. Sometimes it may be necessary to examine the zonal bronchus, i. e., the draining bronchus of the abscess,

with the aid of a catheter. It is important to determine whether the abscess is due to the presence of a foreign body; should that be the case, one should immediately remove the foreign body by bronchoscopy or by surgical intervention.

The speaker stated that generally, unless the beneficial effect of an antibiotic course reveals itself within the first week of treatment, this therapy alone will not be sufficient to obtain a recovery. There is danger that, because of unduly prolonged medical treatment, the abscess may become chronic; in such cases surgical intervention will be complex and the condition of the patients grave. The abscess, therefore, becomes the exclusive dominion of the surgeon after a maximum of one and a half months of medical treatment. Sometimes the roentgenologic examination will show clearly within two or three weeks that the abscess is healing or becoming worse.

Surgical treatment may be instituted according to direct or indirect operative methods (pneumonotomy, pneumoresection, lobectomy, total pneumonectomy) or according to collapsotherapeutic methods. These last methods, however, have been nearly completely abandoned except in conjunction with other types of treatment. Pneumonotomy is definitely indicated in cases of acute simple pulmonary abscess with a single cavity or as an emergency intervention to control progressive pulmonary gangrene. Pneumoresection may be performed above all in cases of not too extensive chronic suppuration or in cases in which difficulties may be envisaged with regard to isolation of the pulmonary lobes. The speaker believes that surgeons today are more orientated toward "ectomy" in any type of chronic suppuration. The indications for lobectomy should correspond to essential requirements as follows: suppuration limited to the lobe to be removed, absence of pleural thickening and satisfactory general condition of the patient. Total pneumonectomy is indicated in diffuse bronchiectasis involving the entire lung and in multiple suppuration in one and the same lung.

On the basis of results obtained in 150 cases of suppurative pulmonary forms at his clinic, Professor Ceccarelli concluded that the percentage of recovery is higher with early intervention and that the chronic abscesses may be dissolved only by surgical exeresis, which as a rule should be lobectomy. Lobectomy and pneumectomy will offer advantages compared with pneumoresection particularly in cases in which the disease process approaches the hilus. According to the latest statistics the operative mortality varies between 5 and 25 per cent. The speaker predicted that the day is approaching rapidly when the pulmonary suppurative forms will be treated by simple surgical drainage, as is practiced in all other types of abscesses.

Professor Brunner, director of the Surgical Clinic in Zurich, reported on extrapleural pneumothorax as a method of surgical treatment in pulmonary tuberculosis. On the basis of his experience with about 1,000 pneumolyses, he believes that extrapleural pneumothorax may be maintained for a sufficient period by means of regularly repeated injections of air. One may wait even three to five years before allowing the lung to expand. Extrapleural pneumothorax is the method of choice in young patients with recent cavities not larger than a walnut. Complete return to health may result in such cases, provided that the injections of air are repeated regularly. Since extrapleural pneumothorax interferes little with respiration, it may be practiced likewise in bilateral forms, in so-called borderline cases in which no other type of collapse is permissible.

Dr. Berard of the Medical Faculty of Lyon discussed exeresis in the surgical treatment of pulmonary tuberculosis, based on his own 100 operations (lobectomies and pneumonectomies) performed from January 1948 to May 1949. The patients were operated on according to precise directives, and the interventions were combined with preoperative and postoperative treatment with streptomycin. Anesthesia always was performed with the aid of tracheal intubation. The most noteworthy result was the actual benignity of the surgical exeresis in patients with pulmonary tuberculosis as shown by an operative mortality rate of 6 per cent. The most important complication of these interventions was the production of secondary empyema. Prognosis depends essentially on the condition of the bronchus. Eighty-three of the 100 patients are alive; 71 are in good health.

Professor Paulino, head of the Surgical Service of the General Policlinic of Rio de Janeiro, was invited to present a report on thoracoplasty with total apicolysis and ligature of the apex of the lung. Because of sudden illness Professor Paulino could not take part in the congress, and his report was read by Professor Cevolotto, chairman of the "Medical Days." In his report Professor Paulino discussed a modified technic of thoracoplasty. An attempt was made to obtain retraction of the cavity by an extensive collapse of the diseased area, but it was not possible to act directly on the bronchus corresponding with the cavity. To obtain the maximum collapse of the apex of the lung, it is necessary to perform an apicolysis by Semb's method after the thoracic resection; but it is difficult to maintain the maximum collapse obtained at the time of the operation. For this purpose the speaker thought of the possibility of immobilizing circularly the apex of the lung. He described minutely his technic and indicated some specific rules to be observed.

Dr. Michetti, medical director of the sanatoriums of Miremont and Les Buis in Leysin (Switzerland), and Professor Barchi, director of the Sanatorium of Verona-Chievo, reported on intrapleural pleurolysis, or Jacobaeus' operation, and recalled that, after being rejected for many years, it has become one of the most useful interventions on the thorax for pulmonary tuberculosis. The technic may appear easy on superficial examination, but it is rather difficult when actually practiced. Among the various methods suggested, one was designed by Dr. Michetti. The speakers praised the results obtained with Jacobaeus' operation.

OSLO

(From a Regular Correspondent)

Dec. 27, 1949.

Dr. Reichborn-Kjennerud and Medicine in Norway

The death of Dr. I. Reichborn-Kjennerud on Aug. 7, 1949, at the age of 84, has reminded his colleagues of the important part he played in many fields, particularly in medicine. He was born in the town of Hamar and entered the University of Christiania, as Oslo was then called, in 1883. He graduated as a doctor of medicine in 1891. During his student years he was also a teacher, giving lessons in French, Latin, botany and histology. The army claimed his services for many years, which gave him opportunity to study folk lore in different parts of the country. His familiarity with French and the classical languages served him well, and he was a generous contributor to the lay press, through which he did much to educate the public on medical subjects.

The outstanding feature of Reichborn-Kjennerud's career was his monumental work, in five large volumes, entitled "Vaar Gamle Trolldomsmedicin," and published under the auspices of the Norwegian Academy of Science in the course of twenty years, 1928 to 1947. Because of his literary touch and a gift for presenting information in an easily digestible form, the author succeeded in making his work highly readable as well as informative. The transition which medicine has undergone from the witchcraft of the sagas to the superstition of the middle ages and the teachings of the present time is traced with skill and the detached outlook of a scientist endowed with the historical sense. A much shorter work, covering some of the ground dealt with in the five volumes, bore the title "Vaar Eldste Medicin til Middelalderens Slutt." Despite prolonged ill health toward the end of his life, Dr. Reichborn-Kjennerud continued to work and to enjoy it to the last. His biographer, Professor Harbitz, has given interesting details of his career in *Nordisk Medicin* for Nov. 18, 1949.

SWEDEN

(From a Regular Correspondent)

STOCKHOLM, Dec. 14, 1949.

Tuberculosis in Cattle

The recent statement by Dr. Erik Hedvall of Uppsala to the effect that bovine tuberculosis soon may be eradicated in Sweden requires some amplification. It is curious that bovine tuberculosis should have been so important in Sweden when it has remained nonexistent in Norway. This geographic difference may be due to the importation of tuberculous cattle from Holland and other countries into Sweden more than a century ago to improve the breed; Norway has not permitted such a dangerous import. At the present time, every doctor in Sweden must notify the veterinary authorities of infections of human beings when the bovine type of tubercle bacillus is diagnosed or even suspected. The veterinary authorities must notify the medical authorities whenever tuberculosis of a cow's udder is observed. The doctor attached to the tuberculosis dispensary in the district in question then must inquire into the possibility of tuberculosis developing after use of milk from the tuberculous udder.

The Danish Bang system for the control of tuberculosis in cattle by means of tuberculin tests has done much to rid herds of tuberculous cattle. This system has been too costly in districts in which tuberculosis was most widespread, and since 1910 use has been made of the Ostertag system, by which the calves of tuberculous cows are isolated and wholesale slaughtering of positive tuberculin reactors is avoided. These measures, financial subsidies for the slaughter of tuberculous cattle and the provision of guaranteed tubercle-free milk have caused about 72 per cent of Sweden to become free from bovine tuberculosis. At the end of 1948, 94 per cent of the milk used by dairies came from tuberculin-controlled herds; 1.74 per cent came from clinically controlled herds, and only 4.26 per cent came from herds free of control. In the areas in which bovine tuberculosis is not completely stamped out, about 90 per cent of the herds are under tuberculin control. Cattle can no longer be imported into Sweden unless guaranteed free from tuberculosis.

Infarction of the Heart

Figures quoted by Dr. Haqvin Malmros of the Ørebro Central Hospital in Sweden tend to substantiate the claim that coronary thrombosis with infarction of the heart has changed from a somewhat rare to a common disease. Before World War II and during the first years of it, only 20 to 25 patients with infarction of the heart were admitted to this hospital every year. In 1948, there were 130 such cases, and the 25 among them ending fatally were verified by a postmortem examination. Before the war the number of deaths due to arteriosclerosis per 100,000 inhabitants was more than twice as great in Sweden as in Norway. The difference became still greater in 1945, when there were only 23 such deaths per 100,000 in Norway as compared with 149 such deaths per 100,000 in Sweden. In other words, the death rate from this cause was more than six times higher in Sweden than in Norway.

These and various other challenging observations have led Dr. Malmros to seek explanations in differences in the diets. He wonders whether diets rich in cholesterol could be responsible for the arteriosclerosis and infarction of the heart. He also questions the current overproduction of eggs in Sweden; could this be a threat to the health of the nation, at least that section which is predisposed to xanthomatosis or Müller's disease? The fifty million eggs in storage in Sweden at one time in 1949 may perhaps be a national danger rather than a national asset, and Dr. Malmros suggests that if the problem cannot be solved by exporting the surplus of eggs it would be well to kill off many of the hens producing them. The Swede who is predisposed to this class of disease would also do well to ration himself with regard to butter and other foods rich in cholesterol. Evidently there are many in this class to judge by the 27 cases of xanthelasma of the eyelids and arcus corneae discovered by Dr. Malmros during a fortnight's survey of the occupants of the Medical Department of the Ørebro Hospital. This indictment of foods rich in cholesterol offers a rather melancholy prospect of radical changes at the breakfast table in the city and on the farm.

CHILE

(From a Special Correspondent)

Dec. 23, 1949.

Inter-American Congress on Radiology

The Third Inter-American Congress of Radiology was held Nov. 11-18, 1949, at Villa del Mar, Santiago, Chile. The two previous congresses had been held at Buenos Aires and Havana in 1943 and 1946, respectively. Dr. F. Daza Brandes was president. Attendance was excellent. There were 87 radiologists from Chile, and more than 100 delegates of the United States, Central America and South America responded to special invitations from Chile. Drs. Elis Berven of Stockholm, Francis Perrin of Paris and Graham Hudgson of London also were specially invited and attended the congress. In the first plenary session Drs. Berven of Stockholm, Edith Quimby of New York and Perrin of Paris spoke on treatment of cancer of the tongue, radioactive isotopes in cancer and development of atomic energy in France, respectively. In the session on radiologic examination of the cranium, Dr. Hudgson spoke on radiology of the temporal bone.

Dr. Felix Daza Brandes presided over the sessions of the congress. Official speakers were: Drs. R. Pereyas, A. Castellanos and J. J. Centurion of Cuba, J. Mata Martínez of Ecuador, N. Dorbecker of Mexico, E. Kreutzer, M. Malenchini and S. S. Pennington of Argentina and J. L. Duomarco of Uruguay, who spoke on "Radiologic Examination of the Cardiovascular Apparatus with Contrast Mediums"; Drs. Graham Hudgson of England, J. G. Sobá of the Dominican Republic, P. J. Hodes of Philadelphia, E. G. Mayer of Vienna, C. Viviani and S. Riesco of Chile, H. Quereilhac, O. Noguera and J. Cataldo of Argentina and M. Neira of Chile, who spoke on "Simple Radiologic Examination of the Cranium for Diagnosis"; Drs. M. Roxo Nobre of Brazil, L. Guzmán of Chile, M. Lenz, H. D. Davis of the United States of America, C. Sayago, A. Rahausen and H. Raventos of Chile and L. P. Costa of Argentina, who spoke on "Treatment of Cancer of the Tongue by Means of Radiations," and Drs. F. Leborgne of Uruguay, J. L. Molinari and E. Lanari of Argentina, M. Mella Veloso of Chile, J. A. del Regato of the United States and R. Restrepo of Colombia, who spoke on "Treatment of Cancer of Neck of Uterus by Means of Radiations."

The organization of the congress was in charge of the Sociedad Chilena de Radiología. The chairman, Dr. J. T. Case, of the American delegation, who made a speech at the inaugural session, presented to Dr. F. Daza Brandes, president of the congress, a medal with the names of the presidents. The College of Radiology of the United States plans to present to the presidents of inter-American congresses a similar medal. The delegation from England presented to the president a gong and a gavel, which will be used during debates in future congresses.

Ceremonies for entrance of new members of the Inter-American College of Radiology were held at the closing session under the presidency of Dr. J. T. Case of the American delegation and also of Drs. H. D. Davis, J. A. del Regato, Edith Quimby and P. J. Hodes. This distinction was conferred on

Drs. F. Daza Brandes, L. Opaso and L. Guzmán of Chile, S. Di Rienzo of Argentina, G. Esquerra Gómez of Colombia, A. Frangella of Uruguay and O. Soto of Perú.

Tribute was paid, in the course of the congress, to the memory of Dr. J. F. Merlo Gómez of Argentina, president of the First Inter-American Congress of Radiology. In memoriam speeches were made by Drs. A. Cabrera, the head of the Cuban Delegation and P. A. Maissa of Argentina. The Fourth Inter-American Congress of Radiology will be held at Mexico City in 1952.

Correspondence

NEURITIS

To the Editor:—At the Fourth International Neurological Congress in Paris, Sept. 5-10, 1949, I drew attention to disseminated sensory mononeuritis as a clinical entity. Because general practitioners see this condition early in its development, I would like to urge them to be on the alert for this puzzling disease. Following is a résumé of my comments at the Congress.

The so-called cryptogenic neuritides or those occurring after general infections present a varied clinical picture. This variation is due to two factors, the first being quantitative: All nerves may be affected, as in panneuritis, or several nerves scattered irregularly over the whole body, as in disseminated neuritis; a group of neighboring nerves or only one nerve may be affected, unilaterally or bilaterally. The result is a single, strictly localized manifestation of a systemic affection. The second factor is qualitative: The morbid process in neuritis may not affect all the conductive systems inside the nerve trunk, but may attack only one or several. Furthermore, in any affected system of the nerve, the disease may lead either to a deficit in innervation, causing paralytic phenomena, or it may lead to an increase of stimulation and irritative phenomena.

Thus, it is understandable that a purely sensory neuritis may occur in which only the superficial (skin) nerves are affected and in which only the sensory innervation of the skin is defective. The two outstanding types of such a clinical entity are: (1) sensory mononeuritis and (2) disseminated sensory mononeuritis. The sensory mononeuritis usually occurs after infections such as the grippe, influenza and cold. The nerves most often isolatedly affected are the saphenous nerve, the lateral cutaneous nerve of the thigh, the trigeminal and the nerves supplying the skin on the fingers and toes. The affection never extends beyond the involved nerve; the course is self limited.

The disseminated sensory mononeuritis is a definite clinical entity of great clinical, pathogenetic, pathophysiologic and differential-diagnostic interest. The outstanding characteristics are: 1. The cause cannot be determined, there seldom being any time relationship with an infection. 2. The onset is so insidious that it is hardly noticeable, and the patient often discovers it only by chance. 3. The sensory nerves are affected exclusively and usually in their most distal parts. 4. In the sensory innervation of the skin there is a deficit only, the resulting hypesthesia or hypalgesia of the skin often being transient without residual effects and without spontaneous irritative phenomena such as pain. 5. Pain and paresthesias do appear transiently, however, in the corresponding area when the affected nerve is briskly stretched, this sign being the most prominent feature of the disease and often leading to its discovery. 6. Any superficial nerve may be affected, more commonly those innervating the skin of the fingers and toes and of the heel, the lateral cutaneous nerve of the thigh and the cutaneous nerve of the forearm. Those superficial nerves seem to be most frequently affected which are easily subject to traumatization from inside or outside the body. 7. It is essentially a migrant neuritis, erratically and lawlessly involving one nerve after another. The nerves successively affected in the course of the disease are often remote from each other. Contiguous spreading does not occur. 8. The course is extremely mild and chronic, extending over years. A patch of anesthesia may disappear or remain permanent. 9. Constitutional signs and symptoms never occur. 10. In the few cases in which lumbar puncture was done, the fluid was found normal.

Nothing definite can be said about the etiology of this puzzling disease. Practically speaking, two conditions come into consideration—an obscure metabolic disturbance or a toxi-infectious process. The latter seems more probable. It is best to assume that we are dealing here with a specific or nonspecific reaction to a neurotropic virus of exceedingly low virulence with exclusive affinity for the sensory nerves. Such a virus infection may involve the peripheral nervous system as it occurs in the peripheral form of encephalitis epidemica and poliomyelitis.

Sensory neuritides are comparatively common. The frequency with which they are found, once interest is concentrated on them, is surprisingly great. Many cases escape detection because the manifestations are so inconspicuous. It is often said that everyone has poliomyelitis at one time or another; the same can be said of sensory neuritis. Nearly everyone gets it, but it is so mild that the patient hardly notices it and it is seldom identified accurately. In only a few cases are the clinical features so obvious that the condition can be easily diagnosed as a neuritis. In these cases disseminated sensory neuritis certainly has much in common with multiple sclerosis: the same chronic course extending over years, the same comparatively benign character of the lesion, the same scattered distribution of the lesions, the tendency to remissions and intermissions and the same coincidence of healed and new lesions. In both conditions the affection is restricted to the nervous system and constitutional manifestations are absent.

Though the clinical manifestations of this disease are insignificant and its course is self limited, uncomplicated and benign, it raises many complex questions which cannot be answered at present.

Robert Wartenberg, M.D., San Francisco.

HUSBAND AND WIFE BLOOD TRANSFUSION

To the Editor:—The case discussed in a current comment in The Journal, Dec. 3, 1949, page 996, is unusual. A hemolytic reaction following a blood transfusion is usually due to some clerical or technical error involving the A-B-O groups or the Rh_0 factor. In addition to the A-B-O groups and the Rh_0 factor, there are many other blood factors which at times have given rise to isosensitization, such as the M, N and S factors, the P factor, the factors, rh′, rh'', hr′, hr'' and rh^w, the Lewis factor and the Kell factor mentioned in Dr. Chown's article. If the mother's blood lacks any of these blood factors and the fetus inherits the factor in question from the father who possesses it, the possibility of isosensitization is present. Therefore, to be consistent one should type every patient requiring a blood transfusion not only for A-B-O and Rh_0 factors, but for every factor listed above. Luckily, however, only the A-B-O factor and the Rh_0 factor are potent antigenically, and for practical purposes it is sufficient to limit the tests to the four blood groups and the Rh_0 factor and to rely on the cross-matching tests to detect any incompatibility with regard to the other factors.

The conclusion mentioned in the current comment, namely, that a woman should never be given a transfusion with her husband's blood, is too strong. If the husband and wife belong

to the same A-B-O blood group and are both Rh positive or Rh negative, and if they are compatible on cross matching, one need not hesitate to use the husband's blood for transfusion. However, since all the antigens are inherited, it is clear that the husband's relatives would be somewhat more likely to share antigens with him than unrelated persons. However, the chance of sensitization to any factor other than A, B and Rh$_0$ is so small that the advantage from using blood from a stranger in preference to that of the husband or his relatives is minimal. Of course, there are records of adverse reactions when blood from relatives of the husband was used, but there have been at least as many in which blood from complete strangers was used, especially now, when almost every large hospital in this country has a blood bank.

A. S. WIENER, M.D., Brooklyn.

EFFECT OF PROCAINE ON THE HEART

To the Editor:—Interest in intravenous procaine therapy is spreading rapidly. Many articles have been published recently on its use in widely varied fields. A little recognized but potentially dangerous side effect is the action of procaine on the heart. Wilburne and Uhley reported striking changes in the electrocardiograms of dogs following rapid intravenous injection of large doses of procaine (J. A. M. A. **138**: 449 [Oct. 9] 1948; *Am. Heart J.* **36**: 576, 1948). Edmonds and his coworkers (J. A. M. A. **141**: 761 [Nov. 12] 1949) reported marked circulatory depression as a serious hazard in the use of intravenous procaine during anesthesia.

We have studied the effects of intravenously administered procaine on the electrocardiogram of 42 subjects. These patients were receiving procaine for various diseases. Electrocardiograms were made before and immediately after the infusions. Variations of shape and decreased voltage of the P waves, QRS complexes and T waves were noted. A definite prolongation of the P-R interval was seen in 5 cases. Therapy was discontinued in 2 because of a rapid increase in conduction time.

Two dosages were used. Thirteen patients received 4 mg. per kilogram of body weight in twenty minutes, and 29 received 1,000 cc. of 0.1 per cent procaine (1 Gm.) in one hour. There was no difference in the number of changes produced by either dosage. In all, 13 patients (31 per cent) showed one change and 17 (40.5 per cent) showed more than one change, while only 12 (28.5 per cent) showed no change. A full report on our study is being published elsewhere (*Journal of the Indiana State Medical Association*). Our results confirm the impression that procaine is a powerful depressant of the heart and should be used with caution, particularly in persons with heart disease.

FRED S. CARTER, M.D., La Porte, Ind.
JACK L. EISAMAN, M.D., Bluffton, Ind.

TUMORS OF THE RECTUM

To the Editor:—I desire to add a few comments to the article by Drs. McLanahan, Grove and Kiefer (J. A. M. A. **141**: 822 [Nov. 19] 1949) on rectal adenomas showing signs of malignancy.

Like benign tumors, pedunculated noninvasive malignant adenomas, even with short pedicles, can be removed easily and effectively at or with the mucosal base by means of the high frequency snare (*New York State J. Med.* **49**: 2311 [Oct. 1] 1949).

The sessile adenomas that cannot be extirpated safely with a snare can also be removed with relative ease by means of the high frequency, double loop resector (*Surgery* **12**: 729 [Nov.] 1942). Furthermore, sessile adenomas located in inaccessible areas, such as the upper surface of a rectal valve, can be extirpated with this instrument, although in these cases both the tumor and the rectal valve may have to be resected electrothermically. Much of the tissue removed with this resector retains enough of the original architecture so that it remains suitable for histologic examination, thus affording an opportunity for the detection of malignancy in the deep layers of an adenoma. Since the construction of this instrument I have not had to resort to surgical excision of lobulated or villous (papillary) rectal adenomas (Treatment in Proctology, Baltimore, Williams & Wilkins Company, 1949). The proper use of this resector, of course, can be mastered by practice.

On the other hand, invasive malignant adenomas should be regarded and labeled by the pathologist as frank carcinomas and logically accorded appropriate surgical excision, namely, resection of the rectum or, in the case of colonic lesions, segmental colonic resection. The existing confusion may disappear if the term "invasive adenoma" is abandoned and superseded by the term carcinoma, for which radical surgical removal is believed mandatory by all.

ROBERT TURELL, M.D., New York.

INDIAN HEALTH SERVICE

To the Editor:—Those who seem to be in favor of socialized medicine should read the article in the *American Journal of Public Health* (**39**: 1403 [Nov.] 1949) entitled "The Health of the American Indians," by Dr. Foard, director of Medical Service, Bureau of Indian Affairs. Dr. Foard states:

"This same pattern of procedure holds true for other tribes of Indians and prevails until conditions become intolerable. . . . It was only within the past sixty days that the first sanitary inspector was ever employed for field service among the Indians. . . . No pediatricians or nutritionists have ever been employed for field service among the Indians. . . . There has never been an organized local public health program to serve Indians."

The editorial in the same journal (page 1469) calls it "Indian Massacre—New Style."

Here we have a medical department of the government, a decentralization of the entire health service for Indians, which is practically the opposite of what the advocates of socialized medicine are after. If the government cannot handle Indian medical affairs, a comparatively small operation, I wonder how they would handle one of considerably larger proportions?

CHRIS. P. SEGARD, M.D., Leonia, N. J.

AUSCULTATORY RESPIRATORY MURMUR

To the Editor:—In the current comment on page 1238 of THE JOURNAL of Dec. 24, 1949, you called attention to my new conception of the auscultatory murmur, for which I wish to thank you. I think it would have been well if you had given references to the articles that I have published. In this day, when physical diagnosis is being so much neglected, I have been surprised at the number of persons who have been interested in these papers. I have had more requests for reprints of these articles than of any papers that I have ever published; they have come from all parts of the world, even South Africa, Israel and India. The articles referred to are: Auscultation: A New Appraisal (*Am. Rev. Tuberc.* **56**: 1, 1947), An Historical Review of the Physical Examination of the Chest (*Ann. Int. Med.* **30**: 766, 1949) and Auscultation: A New Conception of the Respiratory Murmur and Its Place in Diagnosis (*Am. Rev. Tuberc.* **60**: 639, 1949).

F. M. POTTENGER, M.D., Monrovia, Calif.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. *Part III.* Boston, Chicago and New York, January. *Parts I and II*, Feb. 13-15. Centers where there are approved medical schools and five or more candidates. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th Street, Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various locations, July 21. *Oral.* Philadelphia, April 23-27, Chicago, Oct. 8-11. Sec., Dr. Curtiss B. Hickcox, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various locations, Feb. 16. *Oral.* Washington, April 7-9. Sec., Dr. George M. Lewis, 66 East 66th Street, New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* Chicago, Feb. 8-10. Boston, April 13-15. San Francisco, June 21-23. The oral examinations in the subspecialties will be held at the same time and places. Asst. Sec., Dr. William A. Werrell, 1 West Main Street, Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, June 3. Sec., Dr. W. J. German, 789 Howard Ave., New Haven, Conn.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, INC. *Written and Reviews of Case Histories. Part I.* Various Centers. Feb. 3. *Oral Part II.* Atlantic City, May 21-28. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various Centers, January 1951. Final date for filing applications is July 1, 1950. *Practical.* Boston, May 22-26; Chicago, Oct. 2-6; West Coast, Jan. 1951. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY. *Part II*, New York City, Feb. 9-10. Sec. Treas., Dr. Harold A. Sofield, Room 1856, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* San Francisco, May. Chicago, October. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Richmond, Va., Feb. 10-12; Philadelphia, March 31-April 2; Cincinnati, May 5-7; San Francisco, June 30-July 2. Exec. Sec., Dr. John Mck. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PLASTIC SURGERY: *Oral.* May-June. Sec., Dr. Louis T. Byars, 4647 Pershing Avenue, St. Louis, Mo.

AMERICAN BOARD OF PREVENTIVE MEDICINE AND PUBLIC HEALTH: *Oral and Clinical.* Chicago, Feb. 7-8. Sec., Dr. Ernest L. Stebbins, 615 N. Wolfe Street, Baltimore 5, Md.

AMERICAN BOARD OF PROCTOLOGY: *Parts I and II (Anorectal Surgery)*, Chicago, Feb. 6-7. Secretary-General, Dr. Louis A. Buie, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Spring Examination. Date and location of examination to be announced later. Final date for filing applications is Feb. 1. Sec., Dr. F. J. Braceland, 102-110 Second Ave., S.W., Rochester, Minnesota.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Chicago, week of June 18. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written*, Various centers, Oct. 25. Final date for filing applications is July 1. Sec., Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia.

AMERICAN BOARD OF UROLOGY: *Oral and Clinical.* Chicago, Feb. 11-15. Sec., Dr. Harry Culver, 7935 Sunnyside Road, Minneapolis 21.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 27-29. Sec., Dr. D. G. Gill, 519 Dexter Avenue, Montgomery.

ALASKA: * Juneau, March 7. Sec., Dr. W. M. Whitehead, Box 140, Juneau.

ARKANSAS: * *Examination.* Little Rock, June 8-9. Sec., Dr. Joe Verser, Harrisburg. *Eclectic.* Little Rock, June 8-9. Sec., Dr. Clarence H. Young, 1415 Main Street, Little Rock.

CALIFORNIA: *Examination, Written.* Los Angeles, Feb. 27-March 2; San Francisco, June 19-22; Los Angeles, Aug. 21-24; Sacramento, Oct. 16-19. *Examination, Oral and Clinical, for Foreign Medical School Graduates.* Los Angeles, Feb. 26; San Francisco, June 18; Los Angeles, Aug. 20; San Francisco, Nov. 12. *Reciprocity, Oral Examination.* Los Angeles, Jan. 21; Los Angeles, Feb. 25; San Francisco, June 17; Los Angeles, Aug. 19; San Francisco, Nov. 11. Sec., Dr. Frederick N. Scatena, 1020 N Street, Sacramento 14.

COLORADO: * *Reciprocity.* Denver, April 4. Final date for filing application is March 18. Sec., Dr. George H. Gillen, 831 Republic Building, Denver.

CONNECTICUT: * *Examination.* Hartford, March 14-15. Secretary to the Board, Dr. Creighton Barber, 160 St. Ronan Street, New Haven. *Homeopathic.* Derby, March 9-10. Sec., Dr. Donald A. Davis, 30 Elizabeth Street, Derby.

DISTRICT OF COLUMBIA: * *Reciprocity.* Washington, March 13. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, June 25-27. Sec., Dr. Frank D. Gray, 12 N. Rosalind Avenue, Orlando.

GEORGIA: *Examination.* Atlanta and Augusta, June. *Endorsement.* Atlanta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

GUAM: *Endorsement.* Agana, last Friday of each month. Sec., Capt. C. K. Youngkin, Dept. of Public Health, Guam, % F.P.O., San Francisco.

INDIANA: *Examination.* Indianapolis, June. Sec., Dr. Paul R. Tindall, 1138 K. of P. Bldg., Indianapolis.

IOWA: * *Examination.* Iowa City, June 12-14. Dr. Walter L. Bierring, Commissioner and Acting Director, Division of Licensure and Registration, State Department of Health, Des Moines.

KANSAS: Kansas City, June 7-8. Sec., Dr. J. F. Hassig, 905 N. 7th Street, Kansas City.

MAINE: Portland, March 14-15. Sec., Dr. Adam P. Leighton, 192 State Street, Portland.

MASSACHUSETTS: *Examination.* Boston, March 14-17. Sec., Dr. George L. Schadt, 413 E. State House, Boston.

MISSOURI: *Examination.* Jefferson City, Feb. 9-11. *Reciprocity*, Feb. 4. Exec. Sec., Mr. John A. Hailey, Box 14, State Capitol Building, Jefferson City.

MONTANA: Helena, April 3-5. Sec., Dr. Otto G. Klein, First National Bank Building, Helena.

NEVADA: Carson City, May 1. Sec., Dr. George H. Ross, 112 Curry Street, Carson City.

NEW HAMPSHIRE: Concord, March 8-9. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 20-23. Sec., Dr. R. S. Hallinger, 28 West State Street, Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. Charles J. McGeoy, Coronado Building, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 31-Feb. 3. Sec., Dr. Jacob L. Lockner, 23 S. Pearl Street, Albany 7.

NORTH DAKOTA: *Examination.* Grand Forks, July 5-7. *Reciprocity.* Grand Forks, July 8. Sec., Dr. C. J. Glaspel, Grafton.

OKLAHOMA: * *Examination.* Oklahoma City, June 7-8. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

PUERTO RICO: *Examination.* Santurce, March 7. Sec., Mr. Luis Cuzto Coll, Box 3717, Santurce.

RHODE ISLAND: * *Examination.* Providence, April 6-7. Chief, Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Examination.* Columbia, June 26-29. *Reciprocity.* First Monday of each month. Sec., Dr. N. B. Heyward, 1329 Blanding Street, Columbia.

TEXAS: * *Examination.* Austin, June 19-21. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH. *Examination.* Salt Lake City, June. Dir., Dr. Frank R. Lees, 324 State Capitol Building, Salt Lake City.

VERMONT: *Examination.* Burlington, Feb. 3-4. Sec., Dr. F. J. Lawlor, Richford.

VIRGINIA: *Examination.* Richmond, June 23-24. *Endorsement.* Richmond, June 22. Sec., Dr. R. D. Graves, 631 First St., S.W., Roanoke.

WEST VIRGINIA: *Examination.* Charleston, April 3-5. Sec., Dr. N. H. Dyer, State Capitol, Charleston.

WYOMING: Cheyenne, Feb. 6. Sec., Dr. Franklin D. Yoder, State Capitol, Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Examination.* Little Rock, May 9. Sec., Mr. L. E. Gebauer, 1002 Donaghey Building, Little Rock.

CONNECTICUT: *Examination.* New Haven, Feb. 11. Address: State Board of Healing Arts, 110 Whitney Avenue, New Haven 10.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Building, Washington.

FLORIDA: *Examination.* June 3. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

IOWA: *Examination.* Des Moines, April 11. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MINNESOTA: *Examination.* Minneapolis, April 4-5. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: *Examination.* Omaha, May 2-3. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

OKLAHOMA: *Examination.* Oklahoma City, April 11. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

RHODE ISLAND: *Examination.* Providence, Feb. 8-9. Chief, Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Building, Providence.

SOUTH DAKOTA: Vermillion, June 2-3. Sec., Dr. Gregg M. Evans, 310 E. 15th Street, Yankton.

TEXAS: *Examination.* Austin, April 21-22. Sec., Brother Raphael Wilson, 306 Nalle Building, Austin.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Act: Injunction to Restrain Enforcement.—This was an action to restrain the state board of dental examiners from holding any examinations or granting any licenses to dental hygienists under the provisions of a 1949 law. A demurrer to the plaintiffs' petition was sustained by the trial court, so the plaintiffs appealed to the Supreme Court of Georgia.

Prior to 1949, the entire law relating to dental hygienists was contained in section 84-1009 of the Georgia Code. Section 1 of the act of 1949 quoted that section and specifically repealed it in its entirety. Section 2 of the new act prohibits any person from practicing as a dental hygienist until he has passed a written and clinical examination. Section 3 of the new act provides "No person shall be entitled to, or be issued such license as set out in Section 1 of this act" unless he possesses certain described qualifications. A proviso clause to section 3 exempts from the provisions of the new act certain persons who have been employed by and are performing the duties of dental hygienists for licensed dentists and who present themselves to the board of dental examiners for a practical examination.

Plaintiffs, a group of dentists, dental hygienists, college-graduate-applicants for dental hygienist licenses and the Georgia Dental Hygienist Association, first contended that sections 1 and 3 of the new act are irreconcilable, ambiguous and unenforceable. It is manifest, the court said, that the reference in section 3 of the new act to section 1 of the new act is purely a clerical error. It is the duty of the court to arrive at the legislative intent and in so doing it should not adopt an arbitrary rule under which it must be held without variance or shadow of turning that the legislature intended to make a typographical or clerical error, the result of which would be to make nonsense of the act, and not to carry out the legislative scheme, but to destroy it. When the figure 1 as used in section 3 is changed to the figure 2, the meaning of section 3 is made clear that the licenses and license certificates provided for under section 2 shall be issued only to graduates of a school or college for dental hygienists as described in the first portion of section 3 and to those bona fide citizens of Georgia who have for two years prior to the passage of the act been employed by and are performing the duties of a dental hygienist for a licensed dentist.

Plaintiffs next contended that the act under consideration was violative of the equal protection and due process clauses of the federal and state constitutions in that the act requires college trained applicants for licenses to take both a theoretical (written) examination and a practical (clinical) examination; whereas, applicants who have worked in a dentist's office would be required only to take a practical (clinical) examination, without a written theoretical examination. We do not agree, said the court. The proviso of section 3 of the act requires that the applicants under the terms thereof shall present themselves to the board of dental examiners "for a practical examination" and shall present to the board satisfactory evidence of meeting the other requirements of the proviso. Section 2 is plain and unequivocal that no person shall practice as a dental hygienist in this state until such person has passed "a written and clinical examination" in a manner satisfactory to the board. The requirements of the proviso of section 3 that applicants thereunder shall present themselves to the board for a "practical examination" do not undertake directly or indirectly to modify or limit the requirements that all applicants shall pass a written and a clinical examination. The word practical is defined by Webster as "capable of applying knowledge or theory to practice." A practical examination would thus cover both theory and practice and comprehend both a theoretical and clinical examination and section 2 requires that all examinations be written and clinical. As thus construed, the court concluded, the act is not violative of the equal protection clauses of the state and federal constitution as requiring one kind of examination for one class of applicants and a different kind of examination for another class, and it does not discriminate against either class of applicants but applies equally to all.

The plaintiffs' other contentions were also overruled and the judgment of the trial court sustaining the defendant's demurrer and dismissing the plaintiffs' petition was affirmed.—*Lamons v. Yarbrough, 55 S. E. (2d) 551 (Ga., 1949).*

Medical Motion Pictures

FILM REVIEWS

The following 16 mm., color, silent motion pictures were prepared in 1945-1948 and are procurable on loan or purchase from the Cleveland Clinic, Euclid Avenue at East Ninety-Third Street, Cleveland 6.

The Anatomy of the Perineum. 700 feet (2 reels), showing time twenty-nine minutes. Prepared by Daniel P. Quiring, Ph.D., and Earl L. Lewis, M.Sc., Cleveland Clinic Foundation.

This film presents the gross anatomic features of a systematic dissection of the perineum in the cadaver. At each stage preliminary titles announce the structures to be displayed, and much of the actual dissection is performed during the course of the film. Frequent labeling and pointing make identification clear. Inflation of compartments, the interpolation of colored charts and diagrams and animation of the time-honored path of extravasated urine following rupture of the urethra aid in coordinating relationships.

The Anatomy of the Arm, Forearm and the Hand. 1,350 feet (4 reels), showing time fifty-six minutes. Prepared by Daniel P. Quiring, Ph.D., and Erna L. Boroush, Cleveland Clinic Foundation. Reel I, Muscles and their Skeletal Attachments. Reels II, III and IV, Nerve and Arterial Supply of the Arm, Forearm and Hand.

The gross anatomic features of a systematic dissection of the arm of a cadaver are depicted in four parts: I, the flexor muscles of the arm, forearm and hand; II, the extensor muscles; III, the nerve supply, and IV, the arterial supply. Introductory titles and labels are presented at each stage, and the origin, insertion and action of the muscles are demonstrated, first with the articulated skeleton and then again in the extremity, dissected, for the most part, during the course of the film. Nerve and vascular supplies are similarly demonstrated in dissection of a second and third arm, the nerves being colored yellow and the arteries red, for display. Such separate dissection favors the individual demonstration of these parts, but opposes the presentation of relationships; no charts or diagrams for this purpose are employed.

The Anatomy of the Leg and Foot. 2,000 feet (3 reels), showing time eighty-three minutes. Prepared by Daniel P. Quiring, Ph.D., and John H. Warfel, Ph.D., Cleveland Clinic Foundation.

The gross anatomy of the leg is presented in a manner similar to that just described for the arm, but in five parts.

These three films are indicative of the increasing use of visual aids in anatomic teaching and should prove valuable for review in the study of gross or surgical anatomy at both undergraduate and postgraduate medical levels. Those on the extremities might be useful also in physical therapy training programs. The films are silent and thus permit the narrator to adapt his comments to the audience viewing them. Among their outstanding features are the abundant use of titles and labels and the frequent pointing to and manipulation of structures. The progress of much of the actual dissection during the course of the film also adds to its liveliness, but the rapidity with which this is performed leaves a rough finish that will offend the professional anatomist. Those who feel that the presentation of the structure of the body gains by functional and clinical correlation will be disappointed that more of such correlation was not introduced, for these films are essentially limited to the presentation of regional morphology. The photography is excellent throughout.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1938 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

38:321-480 (Sept.) 1949

Measurement of Regional Circulation by Local Clearance of Radioactive Sodium. S. S. Kety.—p. 321.
*Arterectomy in Treatment of Intractable Pain Following Recovery from Acute Arterial Occlusion. N. E. Freeman, F. H. Leeds and R. E. Gardner.—p. 329.
*Relationship of Atheromatosis Development in Chicken to Amount of Cholesterol Added to Diet. L. Horlick and L. N. Katz.—p. 336.
Cause and Effects of Flow Through Defects of Atrial Septum. E. Hull. —p. 350.
Penicillin Therapy of Cardiovascular Syphilis. G. Flaum and E. W. Thomas.—p. 361.
Mitral Stenosis: Experimental Study of Pulmonary-Azygos Venous Anastomosis. H. Swan.—p. 367.
Precordial Electrocardiogram in Incomplete Right Bundle Branch Block. J. M. Barker and F. Valencia.—p. 376.
Variability of Electrocardiogram in Normal Young Men. E. Simonson, J. Brozek and A. Keys.—p. 407.
Study of Q-T Interval in Rheumatic Fever. M. J. Pokress and E. Goldberger.—p. 423.

Arterectomy in Treatment of Intractable Pain.—Freeman and his associates point out that after recovery from acute occlusion of a major artery to the extremity, even though the circulation is sufficient for tissue nutrition, the patient may have severe rest pain with paresthesias and numbness of the extremity. This pain has been termed ischemic neuritis. Temporary relief may be obtained by blocking the sympathetic nerves to the leg, but sympathectomy is contraindicated. The site of obstruction was visualized by arteriography in 10 patients. Excision of a segment of the thrombosed artery was followed by immediate relief from the pain. There was no significant increase in circulation after this procedure. Arterectomy is of value in the treatment of this type of pain through the interruption of some nervous reflex which originates from the thrombosed artery.

Atheromatosis and Cholesterol in Chicken.—Horlick and Katz report studies on the relation of dietary cholesterol concentration to the blood cholesterol levels and on the effect of various durations of such feedings. Three series of experiments lasting five, ten and fifteen weeks were carried out on young Leghorn cockerels. Each series consisted of five groups of 12 chicks each, making a total of fifteen groups and 180 chickens. The control group in each series was maintained on chick starter mash and water. The four remaining groups received mash containing concentrations of 0.5, 1, 2 and 4 per cent suspensions of cholesterol in cotton seed oil, the oil making up 20 per cent of the diet by weight. Direct relationship was found between the concentration of cholesterol in the diet and the frequency and severity of the atherosclerosis which resulted. There was a relationship between the duration of the feeding period and the degree of atherosclerosis produced for each concentration of cholesterol in the diet. With concentration of cholesterol in the diet above 0.5 per cent, increasing the feeding period beyond ten weeks did not appear to lead to any increase in the amount of atherosclerosis. Atherosclerosis occurred as early as two weeks after the commencement of feeding. Amounts of cholesterol in excess of 0.5 per cent produce much the same degree of hypercholesteremia, suggesting that there is an upper threshold for the assimilation of cholesterol. There is a semi-direct relationship between the degree of lipemia and the degree of atherosclerosis. The reason for the lesser severity of the atherosclerosis after ten weeks of feeding is not clear. The decline in the blood cholesterol levels and the failure to gain in weight are correlative phenomena but need not be the cause of the decreased severity of the atheromatosis. It is conceivable that only those animals with a superior ability to tolerate cholesterol survive beyond ten weeks of feeding; hence, the degree of atherosclerosis which they manifest is less.

American Journal of Hygiene, Baltimore

50:143-262 (Sept.) 1949

Schistosome Dermatitis in New Zealand: I. The Parasite. W. V. Macfarlane.—p. 143.
Id.: II. Pathology and Immunology of Cercarial Lesions. W. V. Macfarlane.—p. 152.
Single Throat Culture as Index of Bacterial Flora of Respiratory Tract. J. H. Dingle, T. J. Abernethy, G. F. Badger and others.—p. 168.
Rate of Bactericidal Action of Triethylene Glycol Vapor on Microorganisms Dispersed into Air in Small Droplets. W. Lester Jr., O. H. Robertson, T. T. Puck and H. Wise.—p. 175.
Studies in Human Malaria: XVI. Results of Massive Subinoculation During Latency from Patients Infected with St. Elizabeth Strain Vivax Malaria. W. C. Cooper, D. S. Rube and G. R. Coatney.—p. 189.
Id.: XVII. Trials of Quinacrine, Colchicine (SN 12,080) and Quinine Against Chesson Strain Vivax Malaria. G. R. Coatney, W. C. Cooper, D. S. Rube and M. D. Young.—p. 194.
Congenital Antiviral Immunity in Swiss Mice. J. A. Anderson and V. Bohn.—p. 200.
Factors in Elimination of Immature Stages of Anopheles Quadrimaculatus Say in Water Level Fluctuation Cycle. E. M. Darrow.—p. 207.
Sweet-Potato Cultivation and Hookworm Disease in Fukien, South China. C. C. Tang.—p. 236.

American Journal of Medicine, New York

7:293-436 (Sept.) 1949. **Partial Index**

I. Electrophoretic, Nitrogen and Lipide Analyses of Plasma and Plasma Fractions of Healthy Young Men. H. R. Pearsall and A. Chanutin. —p. 297.
II. Electrophoretic, Nitrogen and Lipide Analyses of Plasma and Plasma Fractions in Disease. H. R. Pearsall and A. Chanutin.—p. 301.
Spontaneously Precipitable Protein in Human Sera, with Particular Reference to Diagnosis of Polyarteritis Nodosa. H. Lepow, L. Rubenstein, F. Woll and H. Greisman.—p. 310.
*Acute Diffuse Glomerulonephritis. J. Brod.—p. 317.
*Pulmonary Adenomatosis. S. Bubis and J. H. Erwin.—p. 336.
Chronic Pulmonary Granulomatosis: Report of 10 Cases. J. M. DeNardi, H. S. Van Ordstrand and M. G. Carmody.—p. 345.

Acute Diffuse Glomerulonephritis.—Brod reports 66 soldiers, 62 with acute glomerulonephritis, 1 with lipoid nephrosis and 3 with "nephritis with nephrotic syndrome," followed for an average of one hundred and twenty-three days. Some preceding infection was observed in 58 of the 60 patients. Only 8 patients recovered while under observation, and another probably recovered but has persistent hypertension. The remainder were evacuated while still showing evidence of the disease. There were no deaths. The course of the disease had two distinct phases: The first seldom lasted more than a month and consisted of hypertension, edema, acute diminution of glomerular activity with retention of nonprotein nitrogen and a rapid erythrocyte sedimentation rate, hematuria and albuminuria, accompanied with impaired concentration and the appearance of casts. The second phase showed a pronounced tendency to chronicity and was characterized by the absence of hypertension, edema or retention of nonprotein nitrogen but the persistence of albuminuria, miscropic hematuria, impaired concentration, cylindruria, slight or moderate acceleration of the erythrocyte sedimentation rate and also some restriction of the normal fluctuations of glomerular filtration. In a limited number of patients only a partial syndrome developed. Some patients with transient hypertension and edema had little or no evidence of renal involvement. There were patients without extrarenal manifestations, but with reduced filtration, hematuria, albuminuria, impaired concentration and granular casts. Still others had edema and albuminuria alone, or associated with minimal red cells in the urine or with slight impairment of concentration (the nephrotic syndrome). Infections of the great majority of patients were mixtures in varying proportions of these three types. The syndrome called acute glomerulonephritis is a generalized vascular reaction of the allergic type to streptococcic and probably other infections. Transient hypertension and edema are regarded as extrarenal manifestations due to general arteriolar spasm and to increased capillary permeability. Their respective renal equivalents appear to be acute diminution of glomerular activity with retention of nonprotein nitrogen caused by gross spasm of the afferent arterioles, swell-

ing of the glomerular endothelial cells, exudation in Bowman's space and proteinuria. The chronic proteinuria and possibly chronic edema in some cases developing progressively from the acute stage are believed to represent persistence of the capillary lesion. A forty-eight hour period of complete abstinence from food and fluids appeared to exert a transient beneficial effect on hypertension, edema and glomerular activity. Penicillin therapy in no way appeared to alter the course of the disease.

Pulmonary Adenomatosis.—Bubis and Erwin report 2 men aged 66 and 63 years in whom pulmonary adenomatosis was revealed at necropsy. This is a comparatively rare condition, only 19 cases having been recorded previously in human beings. Almost all the patients had histories and physical and roentgen manifestations which were similar and which should lead the observer to suspect the condition if they are seen again. There is a slowly progressive downhill course with pulmonary symptoms after an acute infection which never clears completely. There are exacerbations with partial remissions of symptoms due to the superimposed infections. Roentgenograms show a diffuse conglomerate pneumonic infiltration, with little change over a period of months or years. To date examinations of sputum have revealed no causative organism. Grossly, the lungs are voluminous and heavy, with raised, moist, gray patches of tumor. Microscopically, there is a transformation of the normal alveolar lining by hyperplasia and metaplasia to a benign mucus-producing columnar epithelium.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

62:311-466 (Sept.) 1949

Roentgen Therapy as Sole Method of Treatment of Cancer of Breast. F. Baclesse.—p. 311.
Treatment and Results in Cancer of Breast. E. Berven.—p. 320.
Treatment and Results in Cancer of Breast. S. Cade.—p. 326.
Treatment and Results in Cancer of Breast at Presbyterian Hospital, New York. C. D. Haagensen.—p. 328.
Cancer of Breast. R. McWhirter.—p. 335.
Treatment and Results in Cancer of Breast. G. W. Taylor.—p. 341.
Cancer of Breast. B. W. Windeyer.—p. 345.
Automatic Roentgen-Ray Roll-Film Magazine for Angiocardiography and Cerebral Arteriography. C. T. Dotter, I. Steinberg and H. L. Temple. —p. 355.
Generalized Progressive Scleroderma: Report of Instance of Esophagoscopic Perforation of Esophagus with Description of Roentgenological and Necropsy Findings. G. S. Schwarz and O. K. Skinsnes.—p. 359.
Ulcer Associated with Diaphragmatic Hernia. G. F. Miller and H. P. Doub.—p. 368.
Relative Incidence of Bone Lesions over Thirty-Seven Year Period. S. Moore.—p. 375.
Roentgenologic Examination of Cervical Spine. J. C. Bell and J. B. Douglas.—p. 380.
Bone Metastasis in Malignant Melanoma. D. Wilner and R. L. Breckenridge.—p. 388.
Collapse of Vertebral Bodies in Sickle Cell Anemia. W. A. Henkin. —p. 395.
Evaluation of Planigrams in Pulmonary Tuberculosis. P. Morgenstern, C. E. Carr and W. L. Nalls.—p. 402.
Syndrome of Arteriovenous Fistula of Lung. P. Crane, H. H. Lerner and E. A. Lawrence.—p. 418.

American Journal of Surgery, New York

78:279-416 (Sept.) 1949

Wedge Osteotomy of Neck of Femur in Advanced Cases of Displaced Upper Femoral Epiphysis: Ten-Year Study. L. C. Wagner and M. M. Donovan.—p. 281.
Transplantation of Aortic Segments Fixed in 4 Per Cent Neutral Formalin: Report of Experiments in Dogs. E. C. Peirce II, H. F. Rheinlander, A. R. Moritz and others.—p. 314.
Evolution of Medullary Fixation of Fractures by Longitudinal Pin. L. V. Rush and H. L. Rush.—p. 324.
Treatment of Inguinal Hernia. J. M. Beardsley.—p. 334.
Survey of Brain Tumors for General Practitioner of Surgery. E. Boldrey. —p. 340.
Technic of Operative Cholangiography. N. F. Hicken, V. L. Stevenson, B. J. Franz and E. Crowder.—p. 347.
Acute Non-Traumatic Spinal Epidural Hemorrhage. L. I. Kaplan and P. G. Denker.—p. 356.
Basis for Planned Management in Intestinal Obstruction. M. E. Lichtenstein.—p. 362.
Extraperitoneal Cesarean Section: New Paravesical Approach. R. A. Cacciarelli.—p. 371.
Gelatin Solution as Plasma Substitute in Treatment of Shock from Acute Blood Loss. L. B. Felmus.—p. 374.
Anatomic Considerations in Treatment of Carpal Navicular Fractures. Z. B. Friedenberg.—p. 379.
Episacroiliac Lipomas. V. J. Hittner.—p. 382.
Pelvic Flexion Cast in Treatment of Chronic Lumbar Backache. C. A. Splithoff.—p. 384.

Archives of Dermatology and Syphilology, Chicago

60:307-472 (Sept.) 1949

Suboccipital Dermatitis. F. W. Lynch.—p. 307.
*Association of Progressive (Malignant) Exophthalmos and Localized Myxedema. A. C. Curtis, E. P. Cawley and E. B. Johnwick.—p. 318.
Promin® in Treatment of Certain Dermatoses. L. G. Beinhauer and F. M. Jacob.—p. 338.
Circumcision and Venereal Disease. E. A. Hand.—p. 341.
Manual Epilation in Treatment of Tinea Capitis. J. F. Wilson.—p. 347.
*Disseminate Lupus Erythematosus. H. Montgomery and W. G. McCreight. —p. 356.
Cutaneous Lesions Occurring in Course of Streptomycin Therapy. A. C. Cohen and G. C. Glinsky.—p. 373.
Kveim Reaction in Sarcoidosis. C. T. Nelson.—p. 377.
Disseminated and Circumscribed Neurodermatitis Treated with Phenindamine (Thephorin®). W. E. Wooldridge and H. L. Joseph.—p. 390.
Studies of Sweating: II. Mechanism of Action of Local Antiperspirants. M. B. Sulzburger, F. G. Zak and F. Herrmann.—p. 404.

Exophthalmos and Localized Myxedema.—Curtis and associates found 5 examples in the literature of the simultaneous existence of exophthalmos and localized myxedema. Other reports have implied coexistence of the two conditions but discussed only one or the other component. If all patients with progressive exophthalmos were examined for localized myxedema, or the reverse, an increasing number of persons who had these disorders concurrently would probably be observed. The authors report 6 cases. They feel that progressive exophthalmos and localized myxedema coexist far oftener than recorded. This is supported by the fact that 3 of 4 patients recently seen at the Hospital of the University of Michigan Medical School had both. The fourth patient had only localized myxedema. With 1 exception, these cases illustrate the importance of thyroidectomy in the development of progressive exophthalmos. In case 1, in which progressive exophthalmos made its appearance without antecedent thyroidectomy, the response to medication with thyroid extract was good, but the results of similar treatment in several of the other cases were equivocal. This would appear to corroborate experimental evidence that thyroxin inactivates thyrotropin. All three examples of localized myxedema occurred after surgical removal of the thyroid gland. The authors conclude that the development, progress and duration of localized myxedema, usually on the anterolateral surface of the leg, so strikingly parallels the course of progressive exophthalmos that it can be accepted that the two conditions are allied manifestations of the same underlying disorder and probably both due to an excess of thyroid-stimulating hormone. Thyroidectomy should be avoided in patients with toxic diffuse goiter and ophthalmic changes suggestive of progression. Because these patients may also acquire localized myxedema, the same contraindication to operation should hold for the two conditions.

Disseminate Lupus Erythematosus.—Montgomery and McCreight review the cases of disseminate lupus erythematosus at the Mayo Clinic up to 1948. An analysis of 154 cases seen up to 1938 was presented previously; 132 additional cases are presented now. The authors maintained O'Leary's classification of chronic, subacute and acute types. The chronic type has also been termed the "generalized discoid" type. The authors review some of the similarities and discrepancies between their earlier and later series, pointing out that some of these arise from the changing concept of the disease, and from the fact that internists as well as dermatologists have become more lupus-erythematosus-conscious; as a result there are many more cases especially of the acute disseminate form, in which cutaneous manifestations are minimal or transitory. Sensitivity to light in acute disseminate cases, lesions of the mucous membranes, fever, the presence of infected tonsils, leukopenia, false positive serologic reactions and renal disorders are discussed. Any organ may become involved, although the tendency has been to focus attention on cardiac, renal, hepatic, splenic or arthritic involvement. The authors mention reports on ocular and gastrointestinal symptoms and their own observations on involvement of the central nervous system. The sedimentation rate was increased and the albumin-globulin ratio became reversed as the condition became severer. Aspiration of sternal marrow indicated that lupus erythematosus cells, as described by Hargraves and associates, appear to predominate in cases of disseminate type in which the disease is active or is increasing but are not demonstrable when the condition is quiescent. The

skin shows only minor histologic changes in the collagen or fibrinoid degeneration in the walls of the vessels. The authors prefer not to regard lupus erythematosus primarily as a collagenous disease, but to continue to regard it as of unknown cause. They found little evidence to support the theory of an endocrine or an allergic origin. They agree with Baehr and his associates that the concept of lupus erythematosus as being of tuberculous origin should be abandoned. There is no satisfactory treatment. Avoidance of exposure to the sun, prolonged rest in bed and various supportive measures are indicated.

Archives of Internal Medicine, Chicago

84:361-522 (Sept.) 1949

Clinical and Biochemical Study of Remissions in Nonspecific Arthritis: Report of Case. B. H. Archer.—p. 361.
Barbiturate Poisoning: Report of 3 Cases. L. D. Mayer and I. Greenfield.—p. 379.
*Aerosol and Micronized Ephedrine and Penicillin Therapy of Diseases of the Lower Respiratory Tract: Treatment of Bronchitis, Bronchiectasis and Intrinsic Asthma. S. J. Weinberg and G. L. Packer.—p. 389.
Reflex Vasodilatation by Body Heating in Diagnosis of Peripheral Vascular Disorders: Criticism of Methods. R. H. Goetz and F. Ames.—p. 396.
*Familial Periodic Paralysis: Report on Two Families, with Observations on Pathogenesis of Syndrome. D. K. Ziegler.—p. 419.
*Clinical Syndrome of Occlusion of Posterior Inferior Cerebellar Artery: Report of Three Cases. B. Levine, L. J. Cheskin and I. L. Applebaum.—p. 431.
Relation of Pulmonary Embolism to Peripheral Thrombosis. J. M. Spitzer, N. Rosenthal, M. Weiner and S. Shapiro.—p. 440.
Pernicious Anemia in Early Adolescence: Report of Case in a Girl of Fourteen. H. E. Hamilton and W. M. Fowler.—p. 445.
Gastroenterology: Review of Literature from July 1947 to July 1948. J. B. Kirsner, W. L. Palmer, W. K. Ricketts and others.—p. 449.

Ephedrine-Penicillin Therapy of Diseases of Respiratory Tract.—Weinberg and Packer treated 14 of 28 ambulatory male patients with an average age of 53 years who had chronic bronchial infection, chiefly bronchiectasis, emphysema and intrinsic asthma, with an aerosol ephedrine-penicillin solution; the remaining 14 received a micronized ephedrine-penicillin mixture. The patients treated for three weeks with nebulized (aerosol) ephedrine sulfate U. S. P. followed by aerosol of penicillin calcium gained considerable benefit, as indicated by reduced sputum, increased exercise tolerance, reduced dyspnea, cough and chest discomfort, improved sleep and appetite and decreased epinephrine requirement. The patients treated for an equal period with micronized (dust) ephedrine sulfate U. S. P. followed by micronized penicillin calcium derived apparently equal benefit, with an additional increase in vital capacity. Minor reactions, such as oral dryness, saccharine taste and nausea, appeared in this group. Allergic manifestations seldom accompanied the therapy. Bacteriologic studies indicated approximately equal effectiveness of treatment with moist and dry preparations.

Familial Periodic Paralysis.—Ziegler reports a boy aged 17 with classic familial periodic paralysis, presenting flaccid paralysis of the skeletel musculature, loss of all deep reflexes and electrical excitability of the muscles with complete preservation of sensation and mental function. Attacks occurred usually not oftener than once every two months. They could be produced regularly by oral administration of 200 Gm. of dextrose. Insulin on one occasion and water diuresis on two occasions failed to produce attacks. Paralysis ensued never less than eight hours, and on one occasion twenty-four hours, after ingestion of dextrose. Rest after ingestion of dextrose appeared essential for precipitation of an attack. Serum potassium values during paralysis were at the lower limit of normal on two occasions and pathologically low on two others. Oral administration of potassium chloride appeared to hasten the return of muscular power. Intravenous administration of potassium chloride was ineffective on one occasion. After exposure to cold for one-half hour, forearm muscles of the patient showed weakness for one-half hour, compared to ten minutes' weakness in controls. The basic defect in this condition is probably a disorder of the contractile mechanism of muscle itself, possibly based on chronic deficit of potassium. The paralysis bears some relation to carbohydrate metabolism. The observation that a period of several hours intervened between the administration of the carbohydrate and the onset of the paralysis supports the supposition that the pathologic process occurs in the mobilization of glycogen. It is also significant with reference to carbohydrate metabolism that 2 of the 8 members of the patient's family showed a coincidence of obesity and particularly frequent and severe attacks, suggesting a parallelism to diabetes mellitus. Three cases of periodic paralysis in members of a second family living within 10 miles of, and apparently unrelated to, the first family are reported, suggesting that the disease is more common than is generally believed. One of these 3 patients also presented a coincidence of obesity and severe attacks. The great variability of signs and symptoms shown in familial periodic paralysis and the mild, atypical nature of many manifestations are stressed.

Occlusion of Cerebellar Artery.—Levine and co-workers report 3 cases of the syndrome of occlusion of the posterior inferior cerebellar artery in 2 women aged 71 and 57 and in 1 man aged 56. In 2 patients the involved vessel was on the right, and in 1 it was on the left. The patients were seen in a general medical service in one hospital within a period of one year. The syndrome as originally described by Wallenberg is still, for practical purposes, pathognomonic. It usually includes sudden onset with no loss of consciousness, dizziness, falling toward the side of the lesion, nystagmus, difficult deglutition, homolateral Horner's syndrome, ataxia, trigeminal analgesia and thermanesthesia and contralateral analgesia and thermanesthesia of the body. The basis for the symptom complex is a highly localized lateral medullary lesion, involving the nucleus ambiguus, Deiter's nucleus, the descending root of the fifth nerve, the lateral spinothalamic tract, the medullary sympathetic center, the direct spinocerebellar tract, the restiform body and, occasionally, the nucleus facialis. Etiologically, arteriosclerosis is the most important factor. In the differential diagnosis one must consider occlusion of the vertebral artery, the anterior spinal artery and the artery of the lateral recess. The immediate therapy is the maintenance of nutrition. The prognosis with regard to life and the return of essential function is generally good. The ataxia and inability to swallow often improve after several months.

Archives of Ophthalmology, Chicago

42:225-352 (Sept.) 1949

*Hereditary Myopia. K. C. Wold.—p. 225.
Ocular Allergy: Allergic Phenomena Affecting Eye and Its Adnexa. W. D. Gill.—p. 238.
Anisocoria: Attempted Induction by Unilateral Illumination. I. S. Jones.—p. 249.
Cephalocele of Posterior Part of Orbit: General Survey, with Report of Case. B. Strandberg.—p. 254.
Goniotomy in Treatment of Congenital Glaucoma. H. G. Scheie.—p. 266.
Operations for Blepharoptosis. M. I. Steckler.—p. 283.
Neuromyelitis Optica (Devic's Disease): Presentation of 5 Cases, with Pathologic Study, and Review of Literature. F. C. Stansbury.—p. 292.

Hereditary Myopia.—Wold reports studies on myopia in children under 6 years of age, including 73 newborn infants. Two myopic infants were found among 73 newborn infants (2.7 per cent). Fifteen of 231 children under the age of 6 years were myopic (6.5 per cent). The author also made a study of 258 kindred from his personal files, in which at least two generations of proved myopia or of myopia in different and related families of the same generation were found. In 257 kindred with myopia, the following data were obtained: 1. With neither parent myopic, 230 of 645 children (35 per cent) were myopic. In these the myopia was purely recessive. 2. With one or both parents myopic, 309 of 628 children (49 per cent) were myopic. In these children the trait was dominant. The author concludes that there are two types of myopia: (1) hereditary, which may be dominant, recessive or sex-linked recessive, and (2) acquired, due to disease or trauma. Dominant myopia is the most prevalent type, followed closely in frequency by the recessive type, the sex-linked recessive form being the least common. A careful refraction, with consideration given to accommodative power, muscle balance, age and occupation, is the best treatment for hereditary myopia. Proper light, position of the head in relation to reading material, outdoor recreation, well balanced diet and a suitable choice of occupation are important factors. Treatments such as stimulation of the ciliary muscle, administration of calcium for the sclera and thyroid for correction of low metabolic rate and medication for choroiditis cannot alter the hereditary pattern and is therefore futile. Treatment for acquired myopia includes use of ordinary or contact lenses, cataract

extraction, penicillin therapy, local treatment of the eyes and insulin, as indicated. Contact lenses will reduce the amount of myopia and often eliminate astigmatism even in cases of hereditary excessive curvature of the cornea.

Archives of Otolaryngology, Chicago

50:243-372 (Sept.) 1949

Chorda Tympani Nerve Graft: II. Report of Follow-Up Observations One Year Postoperatively. S. Rosen.—p. 243.
Hearing Aid in Mixed Deafness. M. Saltzman and M. S. Ersner, —p. 249.
Streptomycin Toxicity of Eighth Nerve. D. J. Peik, H. High Jr. and P. A. Campbell.—p. 251.
*New Treatment of Acute Aero-Otitis Media. B. C. Trowbridge.—p. 255.
Contact Ulcers and Laryngeal Tuberculosis. H. Johansen and W. Kiser. —p. 264.
*Bacitracin: Its Topical Use in Aural and Pharyngeal Infections. J. E. Coyle, K. Collins and W. J. Nungester.—p. 284.
Tribromoethanol-Ether Anesthesia Used for Tonsillectomy and Adenoidectomy: Analysis of 3,042 Cases over an Eight Year Period. S. C. Yinger.—p. 290.
Use of Thiopental Sodium U. S. P. (Sodium Pentothal®) in Operation on Ear, Nose and Throat. G. E. Fisher and L. S. Woodley.—p. 295.
Radium and the Lymphoid Tissue of the Nasopharynx and Pharynx: New Universal Applicator. W. Morrison.—p. 300.
Primary Amyloid Deposits in the Larynx. L. J. Kreisel, E. E. Muirhead and L. E. Darrough.—p. 309.
Monostotic Fibrous Dysplasia: Report of 2 Cases. S. L. Cooke and W. H. Powers.—p. 319.
Functional Examination of Hearing. A. Lewy, S. L. Shapiro and N. Leshin.—p. 335.

New Treatment of Aero-Otitis Media.—Trowbridge illustrates by means of a diagram the barometric and physiologic conditions which produce acute aero-otitis media during descent in flight. The diagnosis of this condition is readily suggested by a history of recent flight with pain occurring in the ear on descent. The clinical picture results from a trauma like that produced by application of a suction cup to soft tissue. The effect on the mucous membrane of the middle ear is one of a partial vacuum, resulting in vascular engorgement and transudation and exudation of serosanguineous fluid. The fluid that collects effects a neutralization of the pressure differentials and precludes that relief may be obtained through treatment of the eustachian tube alone. Hence, the process of resolution is chiefly dependent on early absorption or removal of the fluid. Under the usual conservative treatment of acute aero-otitis media, absorption of the tympanic fluid occurs within seven to twenty-one days. Although the prognosis of acute aero-otitis media is good under conservative treatment, a shortening of the period of convalescence is desirable. When the secretion was removed from the middle ear by tympanotomy-aspiration the period of convalescence was shortened to an average of four days. A 1 cc. tuberculin syringe with a no. 22 spinal 3 inch (7.5 cm.) (Quincke point) needle is used to aspirate the fluid. The aspiration is made with the aid of a magnifying otoscope. The most suitable point at which to transfix the drum head is just below and slightly posterior to the umbo. It is important that the needle point be placed as low as possible to aspirate effectively the fluid contents of the epitympanum, tympanum and hypotympanum at the same time. The average amount of fluid withdrawn is about 4 minims (0.25 cc.). Prior to the aspiration the tympanic membrane is anesthetized by placing a cotton ear tampon, the point of which has been saturated in aniline oil-cocaine solution, against the lower half of the tympanic membrane for ten minutes. Thorough cleansing of the external canal and the proper application of the anesthetic are necessary to prevent infection of the tympanum. The microscopic perforation produced by the needle heals within several days. Although immediate relief of aural discomfort and deafness follows aspiration, the sensation of a normal ear does not become apparent until several days later when the intratympanic edema has subsided. Aspiration removal of nonpurulent tympanic secretions is the most effective therapeutic measure for obtaining prompt recovery from acute catarrhal otitis media, subacute catarrhal otitis media, secretory catarrh and serous otitis media and for preventing the hearing deficiencies secondary to these conditions.

Bacitracin.—Coyle and his co-workers used bacitracin topically in the treatment of aural and pharngeal infections. There were 21 cases of pharyngeal and/or tonsillar infection and 22 cases of aural infections. Eight patients served as controls for the bacitracin therapy of acute pharyngitis. There were no controls for that of aural infections, but each patient had been treated previously by other methods. Bacteriologic cultures were made of material from the infected area in each case. The susceptibility of the harvested organisms to bacitracin was studied and then compared with that to penicillin. The mannitol fermentation test was routinely done as an indirect method of estimating the virulence of the organisms for man. Bacitracin was effective in the treatment of mild, acute and chronic pharyngeal and tonsillar infections. It was not effective in severe infections of the area. Bacitracin was effective in the treatment of infections of the mastoidectomy cavity. The results were poor in cases of external otitis and chronic suppurative mastoiditis. Correlation of clinical and bacteriologic data was difficult, particularly in regard to the pharyngitides, because of the difficulty of determining which, if any, of the isolated organisms was the probable etiologic factor in the disease. Comparison of the relative degrees to which the organisms were susceptible to bacitracin and penicillin revealed instances in which organisms were susceptible to one drug but not to the other. In general, however, the studies of susceptibility revealed a similar effectiveness of each drug.

Archives of Pathology, Chicago

48:195-280 (Sept.) 1949

Quantitative Study of Effects of Multiple Successive Closed Cerebral Lesions. C. B. Taylor, G. M. Hass and J. E. Maloney.—p. 195.
Intestinal Emphysema in Infants: Review of Literature, with 17 New Cases Reported. D. J. Judge, J. E. Cassidy and E. C. Rice.—p. 206.
North American Blastomycosis: Report of Case in Which Patient with Meningeal Involvement was Treated with Streptomycin and Promin.® H. W. Witaker Jr.—p. 212.
Fibrosarcoma of Helix of Ear. B. Halpert and V. C. Hackney.—p. 218.
Congenital Adenomatoid Malformation of One Lobe of Lung with General Anasarca. K. Y. Ch'in and M. Y. Tang.—p. 221.
Behavior of Hodgkin's Disease Nodes Transplanted into Anterior Chamber of Rat's Eye. G. T. Hoffmann and A. Rottino.—p. 230.
*Hypertensive Cardiovascular Disease: Experimental Study of Tissue Changes in Bilaterally Nephrectomized Dogs. E. E. Muirhead, J. Vanatta and A. Grollman.—p. 234.
*Peritoneal Pseudomyxoma: Report of 4 Unusual Cases. E. D. Rosenfeld. —p. 255.
Influence of Dicumarol® on Streptococcic Infection in Rabbits. G. R. Thuerer and D. M. Angevine.—p. 274.

Hypertensive Cardiovascular Disease.—That the kidney plays an important role in the genesis of hypertensive cardiovascular disease (malignant hypertension) is generally accepted, but the mechanism involved is still a matter of controversy. Muirhead and his co-workers reinvestigated the effects of nephrectomy on the blood pressure and the pathologic changes induced by this operation. By prolonging the life of the animals and concomitantly improving their general state of health, it has been possible to obtain consistent results and to obviate the objections raised against previous work in this field. The prolongation of the life of the nephrectomized dog was made possible by the use of electrolyte-free diets and the application of an artificial kidney. By these procedures, it has been demonstrated that in the dog bilateral nephrectomy is followed consistently by an elevation of blood pressure, which frequently reaches high levels. The authors report that at necropsy the animals displayed the vascular lesions commonly ascribed to hypertensive cardiovascular disease. In addition, the disease process affected muscle tissue throughout the body. The alterations in muscle tissue were of a degenerative and necrotic type and were identical with those seen in the human being dying of hypertensive cardiovascular disease.

Peritoneal Pseudomyxoma.—Rosenfeld says that the commonly accepted genesis of peritoneal pseudomyxoma, described first by Olshausen, is that a cystic dilation of the appendix (mucocele) occurs from occlusion, probably the result of inflammation. The mucocele then ruptures on the peritoneum, where some of the lining cells are implanted, which in turn give rise to cysts; these, with the original mucocele, are thought to be the source of a massive seeding of the peritoneum with myriads of cysts. Along with this process, there is apparently a reactive fibrosis which results in thickening of the peritoneum and of the cyst walls. The question how the cysts arise is not settled. In more than four fifths of the approximately 500 previously reported cases the condition was thought to be of ovarian

origin. The authors describe 3 cases, all in male patients, in which it was appendical in origin. A fourth case, in which the patient was a woman with an unusual history, is included. In one of the reported cases hypoglycemia was an incidental observation; in another, hypoglycemia reached shock levels; in the third, there was a massive infarction of the spleen as a result of compression of the splenic vein and massive encapsulation of the organ with the cystic mucinous growth; the fourth case, that of the woman, was remarkable because of the result obtained with surgical treatment and because death resulted eventually from a perforated mucocele of the appendix. The authors discuss various possibilities as to the genesis of the hypoglycemia. In their opinion the best explanation is that a combination of faulty absorption, hepatic insufficiency and debilitation due to mechanical interference with functions of the bowel and the liver probably led to the hypoglycemic attacks. They review the difficulties of diagnosis and the problem of distinguishing peritoneal pseudomyxoma from mucogenic adenocarcinoma. They suggest that more attention be paid to the possibility that in females peritoneal pseudomyxoma may originate in the appendix even in the presence of an ovarian cystadenoma on an ovarian cystadenocarcinoma, and that the appendix be removed in all cases in which the slightest doubt may exist as to the differential diagnosis.

Archives of Surgery, Chicago

59:373-866 (Sept.) 1949. **Partial Index**

Pharyngeal Neurilemmomas of Cranial Nerve Origin: Medial Displacement of Internal Carotid Artery as Diagnostic Sign. D. P. Slaughter and F. A. de Peyster.—p. 386.
Treatment of "Shock Kidney." J. K. Ormond and M. E. Klinger. —p. 398.
Transplantation of Spinal Cord for Paraplegia Secondary to Pott's Disease of Spinal Column. J. G. Love and H. R. Erb.—p. 409.
Epithelioma of Lower Lip: Evaluation of Dissection of Cervical Lymph Nodes. E. S. Judd Jr. and O. H. Beahrs.—p. 422.
Nonobstructive Lateral Portal Vein-Vena Cava Anastomosis: Clinical Application of Smith Freeman Clamp. O. C. Julian and W. Metcalf. —p. 433.
Sterility and Endometriosis. L. S. McGoogan.—p. 437.
*Surgical Treatment of Tricuspid Atresia. E. H. Fell, B. M. Gasul, C. B. Davis Jr. and R. Cases.—p. 445.
Method for Control of Bleeding from Esophageal Varices. T. B. Patton and C. G. Johnston.—p. 502.
Experiences with Islet Cell Tumors. R. D. McClure and B. E. Brush. —p. 507.
Appendicitis: Ten Year Survey: 1935 Through 1944. E. T. Thieme. —p. 514.
Tetraethylammonium Chloride in Experimental Vascular Injuries of Limb, Bowel and Heart. E. J. Hill, J. M. Hammer, H. C. Saltzstein and C. D. Benson.—p. 527.
Use of Abdominal Flap Graft in Construction of Permanet Ileostomy. C. W. Monroe and J. H. Olwin.—p. 565.
Varicosities of Lesser Saphenous Vein. W. W. Carroll.—p. 578.
Substitution of Urinary Bladder with Isolated Segment of Sigmoid Colon. J. D. Biggard and H. H. Kerr.—p. 588.
Reduction in Mortality and Loss of Limbs in Diabetic Gangrene and Infection. J. S. Regan, B. D. Bowen and P. A. Fernbach.—p. 594.
Prompt Postoperative Activity After Hernioplasty: Its Influence on Incidence of Complications and Rate of Recurrence. J. H. Powers. —p. 601.
*Prevention and Management of Thromboembolism. R. H. Lillie, R. W. Buxton and I. F. Duff.—p. 609.
*Early and Late Sequalae of Therapeutic Vein Ligation for Thrombosis of Veins of Lower Limbs. D. E. Szilagyi and J. F. Alsop.—p. 633.

Surgical Treatment of Tricuspid Atresia.—According to Fell and his associates the Potts-Smith operation, a lateral anastomosis of the pulmonary artery to the aorta, establishes an artificial ductus arteriosus, thus utilizing vessels that are accessible and large enough so that the infant under the age of 2 years who heretofore died of severe oxygen want now has a chance to live. The favorable results obtained with the Potts-Smith procedure in the age group from 4 to 12 months encouraged the authors to attempt this operation on 3 exceedingly small, cyanotic infants with diagnoses of congenital tricuspid atresia, or nonfunctioning right ventricle. The ages of the infants were 7½ weeks, 10 weeks and 5½ months and their weights varied between 7 pounds 1 ounce (3203 Gm.) and 9 pounds 1 ounce (4111 Gm.). The Potts-Smith procedure was successful in these 3 cases, but the authors do not advocate early operation for tetralogy of Fallot or tricuspid atresia unless it is evident that the patient will not survive conservative therapy. The three cases reported led them to believe that they have been influenced too greatly by authors who maintain that operation should not be performed before the patient is 2 years of age. The Potts-Smith operation may be used on the small infant. Time alone will tell whether this procedure will be of permanent benefit. Severe cyanosis associated with an enlargement of the left ventricle, diminution of the right ventricle and left axis deviation in infancy are indicative of tricuspid atresia, in which life expectancy is usually less than one year. However, if the diagnostic criteria are kept in mind relief is possible through surgical measures, provided there are no other congenital abnormalities to contraindicate an operative procedure.

Management of Thromboembolism.—Lillie and his associates report on the management of thrombosis and embolism during the past nine years at the University of Michigan Hospital. Since precautionary measures alone are not sufficient, the authors pay attention chiefly to the anticoagulants, heparin and dicumarol,* and to venous ligation. Adequate facilities for measuring prothrombin are essential for the safe and effective administration of dicumarol.* The physician responsible for the administration of the drug should be prepared in the event of severe or persistent hypoprothrombinemia and severe or persistent bleeding to reverse its effect by giving large doses of vitamin K. From their experience with the 1,150 patients who form the background of this study, the authors list indications for and contraindications to the prophylactic use of anticoagulants. Patients facing an operation and elderly persons might best have their venous thrombosis treated with ligation of veins to obviate hemorrhagic risks attending anticoagulant therapy. At their hospital, whenever ligation of a femoral vein was indicated and a thrombus was found extending into the common femoral vein, an attempt was made to ligate above the clot. Thus, ligations of the superficial femoral vein were done, for the most part, when no clot was detectable above this level. Thrombectomy was performed in all cases in which it was possible to demonstrate a clot. Ligations of the inferior vena cava have been carried out through a retroperitoneal approach, the vessel being ligated in continuity and above the clot. Ligation or anticoagulant therapy often must be adjusted to meet the needs of the patient. There exist instances which call for substitution of one form of treatment for another, or for their combined use. At present, the use of anticoagulants is the treatment of choice. Interruption of a vein is advisable in situations in which use of the anticoagulants is undesirable. Anticoagulants and venous ligation have proved effective when employed along with general preventive measures in reducing the incidence of pulmonary embolism.

Sequelae of Vein Ligation for Thrombosis.—Szilagyi and Alsop present a follow-up survey of all the operations of venous interruption performed in the Henry Ford Hospital from July 1, 1942 to Dec. 31, 1948. The early and late changes that occur in the limbs after surgical interruption of veins were investigated by clinical and roentgenographic means in 100 cases with one hundred and forty-six operations on veins affecting one hundred and fifty extremities. The authors stress the advanced state of thrombotic disease at the time of ligation in a high proportion of the cases. A phlebographic technic employing catheterization of the lesser saphenous vein was used to obtain forty-six phlebograms in 23 cases. Ligation of the main venous trunks draining the lower limbs is highly effective in preventing pulmonary embolism. Eighty per cent of the patients show a new swelling or aggravation of an existing swelling immediately after ligation, but after a month this swelling lessens if a few precautions are observed. Eventually, the condition of a third of the limbs returns to normal, and the residual changes in the remainder are seldom severe enough to interefere with normal life. When the superficial femoral vein is ligated directly distal to its junction with the deep femoral vein, the phlebograms show that ligation precipitates clotting in the segment lying directly distal to the ligature. However, there is no proof that this extension of thrombosis adds to the sequelae. Thrombosis has not been noted proximal to the ligature or in the deep femoral vein, and the absence of clotting in this vein permits the formation of an excellent collateral pathway in most cases of ligation of the superficial femoral vein. Phlebograms show that ample collateral drainage

channels are formed which correspond to anatomic expectations. Recanalization of the thrombosed superficial femoral vein plays no role in the hemodynamic readjustment after ligation. The deep veins of the leg undergo recanalization in many cases; however, restitution of effective venous drainage is often dependent on collateral channels, which in the majority of instances appear to be superficial.

Arkansas Medical Society Journal, Fort Smith

66:63-80 (Aug.) 1949

Diagnosis and Treatment of Cardiac Arrhythmias. A. C. Ernstene. —p. 63.

66:81-92 (Sept.) 1949

*Treatment of Case of Endemic Typhus with Chloromycetin. R. F. McCrary.—p. 81.
Hematuria: Its Clinical Significance. J. F. Clark.—p. 83.

Chloramphenicol (Chloromycetin®) in Endemic Typhus.—McCrary points out that endemic or murine typhus is prevalent in the southeastern part of the United States. He reports that a boy aged 14 received only symptomatic treatment during the first week of his illness. Agglutination tests were negative for tularemia, brucellosis, typhoid and paratyphoid but positive for Proteus OX 19. When finally a diagnosis of murine typhus was made treatment with chloramphenicol (chloromycetin®) was started in the recommended dosage of 60 mg. per kilogram of body weight initially and then 0.25 Gm. every three hours until the patient was afebrile. The initial dose was divided into three capsules (15 mg.) of chloramphenicol every thirty minutes for four doses. On the second day the patient was free from fever and administration of chloramphenicol was discontinued, but on the third day the fever recurred and chloramphenicol was again given every three hours for a total of thirty-six hours, after which the patient was completely asymptomatic. The author concludes that chloramphenicol is an effective antibiotic in the treatment of endemic typhus. It is apparently nontoxic in large dosages, and it does not mask the agglutinations for Proteus OX 19. Cholarmphenicol therapy should be continued at least twenty-four hours after the patient becomes afebrile.

Bulletin of New York Academy of Medicine, New York

25:541-602 (Sept.) 1949

Present Status of Electric Shock Therapy. L. B. Kalinowsky.—p. 541.
Medical, Social and Public Health Aspects of Rehabilitation. H. A. Rusk.—p. 554.
Concerning Voluntary and Involuntary Movements: Role of Cortico-Spinal and Subcortico-Spinal Mechanisms with Concept as to Origin of Movements. A. M. Rabiner.—p. 566.
Psychiatric Perspectives of Today. G. Zilboorg.—p. 577.

Cancer Research, Baltimore

9:511-574 (Sept.) 1949

Lipids of Carcass, Blood Plasma, and Adrenals of Rat in Cancer. F. L. Haven, W. R. Bloor and C. Randall.—p. 511.
Serum Polysaccharide Level in Malignancy and in Other Pathological Conditions. M. R. Sheltar, J. V. Foster, K. H. Kelly and others. —p. 515.
Effect of Tubercle Bacilli Extracts on Induced Tumors of Rat. A. Y. Djanian, W. M. Shanklin and J. M. Butros.—p. 520.
Experimental Production of Endometrial Polyps in Guinea Pig. R. J. Blandau.—p. 526.
Mechanism of Induction of Ovarian Tumors by X-Rays. L. Lick, A. Kirschbaum and H. Mixer.—p. 532.
Studies on Lymphocystis Tumor Cells of Fish: I. Osmiophilic Granules of Cytoplasmic Inclusions and Their Interpretation as Elementary Bodies of Lymphocystis Virus. R. Weissenberg.—p. 537.

Connecticut State Medical Journal, Hartford

13:827-940 (Sept.) 1949

Reduction of Mortality in Surgery of the Aged. W. L. Estes Jr. —p. 833.
Analysis of Cancer of Breast at the Waterbury Hospital, 1931-1948. P. Gedeon.—p. 840.
Coexisting Primary Cancer of Ovary and Fundus Uteri. J. Klein. —p. 849.
Sixteen Years with a Colostomy. E. C. Dubois.—p. 853.
Comparative Study of Various Apparatus and Technics for Aerosol Administration. J. F. Beahey, E. A. Gaensler and M. S. Segal. —p. 855.
The Brown Report and Its Relation to Nursing in Connecticut. C. L. Widmer.—p. 864.
Impact of Socialized Medicine on British Physicians and His Patient. C. Palmer.—p. 867.

Endocrinology, Springfield, Ill.

45:113-210 (Aug.) 1949

Testosterone and Tissue Respiration of Castrate Male Rat with Possible Test for Myotrophic Activity. E. Eisenberg, G. S. Gordan and H. W. Elliott.—p. 113.
Mechanism of Action of Lithospermum Ruderale. M. L. Drasher.—p. 120.
Effect of Growth Hormone Preparations on Alkaline Phosphatase of Tibia. J. C. Mathies and O. H. Gaebler.—p. 129.
Adrenal Changes Produced in Rats by Infection with B. Tularense and B. Coli. G. B. Pinchot, V. P. Close and C. N. H. Long.—p. 135.
Effect of Adrenal Cortex Extract upon Urinary Non-Protein Nitrogen and Changes in Weight in Young Adrenalectomized Rats. D. J. Ingle and M. C. Prestrud.—p. 143.
Effects of Underfeeding on Thiouracil Action in Rats and Mice. J. Meites and I. P. Agrawala.—p. 148.
Influence of Dietary Protein Concentration upon Corticotrophic Action of Lyophilized Anterior Pituitary. S. B. Henriques, O. B. Henriques and H. Selye.—p. 153.
Effects of High Protein Diet on Anemia Induced by Hypophysectomy in Adult Female Rats, Including Further Details on Post-Hypophysectomy Anemia. R. C. Crafts.—p. 159.
Studies on Nature of Protein Catabolic Response to Adrenal Cortical Extract. Accentuation by Insulin Hypoglycemia. F. L. Engel.—p. 170.
Trophic Hormones of Placenta: Failure to Demonstrate Thyrotrophin or Adrenocorticotrophin Production in Hypophysectomized Pregnant Rat. M. A. Greer.—p. 178.
Excretion of Pantothenic Acid and Ascorbic Acid by Intact and Adrenalectomized Rats on Diets Supplemented with and Deficient in Pantothenic Acid. M. E. Dumm and E. P. Ralli.—p. 188.
Effect of Follicle Stimulating Hormone upon Oxygen Consumption of Chick Ovary Slices. O. Nalbandov and A. Nalbandov.—p. 195.

Indiana State Medical Assn. Journal, Indianapolis

42:583-762 (July) 1949

Rights of Tax Officials in Regard to Records of Physicians. B. B. Emswiller.—p. 605.
If I were a Physician Selecting Disability Income Insurance. R. A. Calkins.—p. 608.
Estate Conservation. P. T. Spinney.—p. 610.

42:763-866 (Aug.) 1949

Office Proctology. R. H. Appel.—p. 779.
Management of Breech Presentation. G. W. Gustafson.—p. 783.
Common Office Problems in Gynecology. M. Shellhouse.—p. 787.
Routine Management of Infertile Couple in Private Practice. C. O. McCormic Jr.—p. 791.
Urology in General Practice. J. I. Waller.—p. 796.

42:867-1042 (Sept.) 1949

Treatment of Thoracic and Abdominal Aneurysms of Syphilitic and Arteriosclerotic Origin (Preliminary Report). J. K. Berman, F. J. Boyd Jr. and W. K. Saint.—p. 889.
Treatment of Friedlander's Pneumonia with Streptomycin—Report of Case. R. U. Leser, D. G. Bock, R. A. Switzer and M. E. Godbey. —p. 893.
*Chronic and Recurrent Infectious Hepatitis: Its Relationship to Cirrhosis of Liver. B. D. Rosenak, R. H. Moser and J. D. Howell.—p. 897.
Spontaneous Retroperitoneal Hemorrhage Simulating Appendiceal Abscess. E. A. Garland.—p. 903.
Ectopic Pregnancy. L. F. Beggs.—p. 904.

Recurrent Hepatitis and Cirrhosis of Liver.—Rosenak and his co-workers believe that the dissemination of hepatitis during the war is now reflected in a great increase in the occurrence of this malady in the general population. The usual concept of this disorder has been that it was an acute, self-limited disease. Occasional cases seem to pursue a chronic or recurrent course. The symptoms in such patients are similar or identical to those of the familiar acute forms of the disease. Pain in the right upper abdominal quadrant and tenderness, jaundice, anorexia, nausea and vomiting, intolerance of fatty foods, weakness and hepatomegaly are the common symptoms. The evaluation of liver function tests in chronic hepatitis is difficult. Results of cephalin flocculation and thymol turbidity tests have been positive in a high proportion of cases, but these tests cannot be depended on for confirmation of the diagnosis, which must be based largely on the history and the symptoms. The possibility of a relationship between hepatitis and cirrhosis has long been suspected, because a high percentage of patients with cirrhosis gave histories of having had previous attacks of jaundice. In a review of 106 patients with cirrhosis of the liver seen at the Indianapolis General Hospital in the past ten years, 13.2 per cent gave a history of having had previous attacks of jaundice. Although this cannot be regarded as proof of a causal relationship, biopsy of the liver during hepatitis indicate that inflammatory changes in the liver may be followed by parenchymal degeneration and scarring. Many cases must be studied before it can be concluded irrefutably that hepatitis may be an

etiologic factor in the production of cirrhosis of the liver. An abundance of such material is available in former military personnel, and a long term investigation of these cases should ultimately provide the answer.

Maine Medical Association Journal, Portland

40:251-276 (Sept.) 1949

Surgical Treatment of Varicose Veins. W. H. Bunker.—p. 251.
Cytology and Uterine Cancer Detection in General Practice. J. E. Ayre and W. B. Ayre.—p. 253.
Establishment of Cytological Diagnosis in Laboratory of Small Hospital. H. S. Everett and M. Boddington.—p. 256.
Treatment of Bronchiectasis. L. Brown.—p. 258.
Statistical Analysis of Private Practice in Eastport, Maine. R. S. Buker.—p. 262.

New England Journal of Medicine, Boston

241:287-324 (Aug. 25) 1949

Aureomycin in Treatment of Pneumonia in Infants and Children. B. Olshaker, S. Ross, A. Recinos Jr. and E. Twible.—p. 287.
Development of Tolerance to Ergot Alkaloids in Patient with Unusually Severe Migraine. W. Q. Wolfson and J. R. Graham.—p. 296.
Localized Pretibial Myxedema: Stigma of Hyperthyroidism. G. N. French.—p. 299.
Comparative Study of Formula Processing for Obstetric Nurseries. J. C. Merriam and C. G. Tedeschi.—p. 302.
Gastrointestinal Allergy. F. J. Ingelfinger, F. C. Lowell and W. Franklin.—p. 303.
Suprasellar Epidermal Cyst.—p. 309.
Carcinoma of Gall Bladder. Thrombosis of Hepatic and Portal Veins, Neoplastic. Massive Infarction of Liver.—p. 311.

241:325-350 (Sept. 1) 1949

Medical Considerations in Care of Elderly Patients with Hip Fractures. R. J. Fabey, R. M. Kilfoyle and J. H. Shortell.—p. 325.
Acute Herpetic Gingivostomatitis in Adult. A. M. Rogers, L. L. Coriell, H. Blank and T. F. McN. Scott.—p. 330.
Radiation Exposures from Use of Shoe-Fitting Fluoroscopes. C. R. Williams.—p. 333.
*Potential Dangers in Uncontrolled Use of Shoe-Fitting Fluoroscopes. L. H. Hempelmann.—p. 335.
Gastrointestinal Allergy. F. J. Ingelfinger, F. C. Lowell and W. Franklin.—p. 337.
Metastatic Neuroblastoma of Rib.—p. 341.
Torsion and Infarction of Ovarian Fibroma.—p. 343.

Dangers in Use of Shoe-Fitting Fluoroscopes.—According to Hempelmann there are three types of radiation injuries that may result from the uncontrolled use of low voltage x-ray machines in shoe stores. The most likely injuries are interference with normal foot development of children whose feet are examined under the fluoroscope repeatedly while being fitted with new shoes; acute radiation burns of the customer's feet resulting in late permanent skin damage; chronic radiation injury of the blood-forming tissue of store employees who work with improperly shielded x-ray machines. Growing bone, in contrast to adult bone, is easily damaged by exposure to roentgen rays. This is due to the radio-sensitivity of the epiphyseal cartilage. Damage to this tissue is manifested by reduction in the rate of bone growth and by premature closure of the epiphyseal junction. The minimal stunting dose of roentgen rays has been stated to be a quarter of the erythema dose for infants and half the erythema dose in older children. If this is correct, a few hundred of moderately hard roentgen rays administered in a single exposure will cause a disturbance in foot development in young children. With regard to radiation burns of the skin the author says that at least 600 to 1,000 r of soft roentgen rays given within a day or two would be required to produce a serious skin reaction. There is no published information bearing on the maximum radiation dosage that can be administered to the skin with safety at the intervals at which children are likely to be fitted for new shoes (two to four months). Regarding store employees the author says that the hazards involved in repeated exposure of the body to soft roentgen rays are similar to those encountered in any hospital or physics laboratory that use x-ray machines or radioactive material. The maximum permissible dose of radiation to which persons can be safely exposed throughout their working lives has been considered for many years to be 0.1 r per day. Within the past few months, the Advisory Committee on X-Rays and Radium has reconsidered this dose and recommended that it be lowered to 0.3 r per week.

New Orleans Medical and Surgical Journal

102:55-96 (Aug.) 1949

Public Health and Insurance Aspects of Amebiasis: Note on Certain Erroneous Concepts. J. S. D'Antoni.—p. 55.
American Academy of General Practice: Why the Academy. J. P. Sanders.—p. 60.
Menopausal Bleeding. C. Tyrone.—p. 64.
Oral Estrusol Therapy in Menopause. B. B. Weinstein and C. L. Burger Jr.—p. 66.
*Vaginal Bleeding from the Use of Potassium Permanganate. C. M. Johnson.—p. 68.
Advanced Abdominal Pregnancy. C. G. Wichser.—p. 70.
Value of Proctoscopic Examination in General Practice. M. O. Hines.—p. 72.
Meconium Ileus. W. Sako.—p. 75.
Treatment of Delirium Tremens. J. A. Wallace.—p. 77.
Acute Eye Disorders as Seen in General Practice. A. P. Crain Jr.—p. 78.
Purpura Presumably due to House Dust: Case Report. B. G. Efron.—p. 81.
Possibility of Provocative Test in Allergy: Case Report. S. Cohen.—p. 82.
Subacute Disseminated Lupus Erythematosus: Report of Case Treated with Para-Aminobenzoic Acid. D. F. Bradley.—p. 83.
X-Ray in Diagnosis of Tuberculosis. J. E. Blum.—p. 85.

Vaginal Bleeding Caused by Potassium Permanganate.—Johnson reports 2 cases of severe vaginal bleeding due to the use of potassium permanganate. References to vaginal burns caused by the use of permanganate are rare in this country, but many reports are to be found in the Italian, Spanish and French literature. In this country most cases have been reported from Boston, where this drug seems to be a popular abortifacient. The possibility of its use for this purpose should be kept in mind, and the fact that it can cause vaginal bleeding, closely simulating threatened or incomplete abortion, should be remembered. Women should be cautioned to use the drug only in solution and in the proper dilution if at all. Some women douche by inserting the end of the rubber tubing into the vagina without the tip, and it is possible for a partially dissolved tablet to be deposited in the vagina. A speculum examination of the vagina and cervix should be made routinely in all cases of threatened or incomplete abortion.

New York State Journal of Medicine, New York

49:1983-2094 (Sept. 1) 1949

Injuries to Major Arteries and Their Treatment. R. R. Linton.—p. 2039.
*Post-Traumatic Painful Disabling Syndromes with Associated Vasomotor Imbalance. R. H. Smithwick.—p. 2049.
Etiology of Poliomyelitis. G. Dalldorf.—p. 2053.
Metabolic Aspects of Vascular Degeneration in Diabetes Mellitus. G. E. Anderson.—p. 2055.
Uses and Abuses of Penicillin. P. A. Bunn.—p. 2059.
Discussion of Various Surgical Procedures Employed in Management of Portal Hypertension. J. W. Lord Jr.—p. 2064.
Trend Toward Reduction of Fetal Risk in Obstetrics. W. M. Mallia.—p. 2070.
Convulsive Reaction Pattern. D. J. Simons.—p. 2074.
The Menopausal Syndrome. E. Hoch.—p. 2078.

Post-Traumatic Disabling Syndromes.—Smithwick divides patients with post-traumatic, painful, disabling syndromes with associated vasomotor manifestations into two groups, those with causalgias and those with the remaining allied disorders. In the first group may be placed patients whose syndrome follows a penetrating wound with a lesion of a peripheral nerve containing sensory fibers. It is manifested by pain in the extremity, hand or foot primarily, which is accentuated by certain disturbing elements in the patient's environment. The pain is most frequently constant and burning in nature. Hyperesthesia of the affected part is the rule. In the vast majority of cases some associated vasomotor abnormality, with vasodilatation in the early phases and vasoconstriction in the later phases of the disorder, was noted. In the second group are patients who have in common a nonpenetrating injury without an obvious lesion of the peripheral nerve. Their pain is not as a rule burning in nature and is often intermittent rather than constant, being greatly intensified by attempts to use the part. Weight-bearing is particularly painful. Vasomotor changes varying from slight to pronounced are nearly always present, and vasoconstriction seems to be more common than vasodilation. Hyperesthesia is seldom present. The part of the vasomotor system in the development and perpetuation of the symptom complex in the patients of both groups is

stressed. It is important to recognize these syndromes before advanced atrophic changes occur. The efficacy of treatment by paravertebral procaine block of the sympathetic supply to the extremity, or when necessary by sympathectomy, are emphasized. The evidence suggests that the pain relief is related to the interruption of sympathetic motor impulses rather than to the blocking of afferent fibers which transmit pain sensation.

Ohio State Medical Journal, Columbus

45:845-940 (Sept.) 1949

Alveolectomy. K. Tschiassny.—p. 869.
Plastic Surgery—4 Case Reports. S. Seltz.—p. 873.
Laboratory and Clinical Evaluation of New Antacid Preparation. E. A. Brown.—p. 875.
Tumors of Nasopharynx. H. C. Rosenberger.—p. 878.
Syphilis 1949. L. J. Roth.—p. 883.
Pregnancy Complicated by Regional Ileitis. W. C. Weir, A. J. Beams and F. S. Gibson.—p. 887.
Ten Per Cent Crotonyl-N-Ethyl-O-Toluidine Ointment (Eurax), New Scabicidal Agent. A. J. Tronstein.—p. 889.
Common Eye Injuries. R. S. Rosner.—p. 892.
Rehabilitation in Small Communities. S. Gamble.—p. 893.

Public Health Reports, Washington, D. C.

64:1061-1096 (Aug. 26) 1949

Fluorine in Foods: Survey of Recent Data. F. J. McClure.—p. 1061.
Iodine—Food Essential. W. H. Sebrell.—p. 1075.

64:1097-1132 (Sept. 2) 1949

Tuberculosis Beds in the United States. E. Hanna and S. Glaser.—p. 1098.
Characteristics of Commercial X-Ray Screens and Films—IX. W. W. Van Allen.—p. 1124.

64:1133-1168 (Sept. 9) 1949 Partial Index

Spontaneous Infection of Brown Dog Tick, Rhipicephalus Sanguineus with Coxiella Burnetii. R. R. Parker and O. Sussman.—p. 1139.

64:1169-1194 (Sept. 16) 1949

Proposed Elements of State Cancer Control Program. R. F. Kaiser.—p. 1169.
Nomenclature of Strains of C. Diphtheriae. K. I. Johnstone and J. W. McLeod.—p. 1181.

Quarterly J. of Studies on Alcohol, New Haven, Conn.

10:185-380 (Sept.) 1949

*Treatment of Alcoholic Patients in Denmark with "Antabuse": With Suggestions for Its Trial in the United States. E. Glud.—p. 185.
Group Psychotherapy with Alcoholics: Preliminary Report. A. Z. Pfeffer, P. Friedland and S. B. Wortis.—p. 198.
Group Therapy in Alcoholism: Transcriptions of Series of Sessions Recorded in an Outpatient Clinic. II. Third Session. R. G. McCarthy.—p. 217.
Medical Approach to Problem Drinking: Preliminary Report. J. J. Smith.—p. 251.
Personality and Social Implications in the Life of the Alcoholic Veteran. E. F. Mueller.—p. 258.
Alcoholism Among Disciplinary Cases in Industry: Preliminary Study. C. C. O'Brien.—p. 268.
Alcohol Research in Sweden, 1939-1948. L. Goldberg.—p. 279.
Ancient Experience with Intoxicating Drinks: Non-Attic Greek States. A. P. McKinlay.—p. 289.
Patterns of State Taxation of Distilled Spirits: With Special Reference to Kentucky. O. F. Traylor.—p. 316.

Treatment with Antabuse.—According to Glud, experience with tetraethylthiuramdisulfide (antabuse) in Denmark indicates that there should be two phases of treatment: (1) the administration of antabuse which induces the patient to shun drinking and (2) psychotherapeutic care, which supports the patient in his desire to continue medication, to readjust himself socially and to make necessary changes in his habits. Psychotherapy from the beginning, partly on an individual basis and partly in groups, is considered to be of utmost importance. From the reports of Scandinavian investigators and from work done in the United States and Canada, it seems justifiable to recommend that most alcoholics should have their first and second trials with antabuse under supervision in a hospital or sanatorium. The more severely ill patients should always be hospitalized during the first two to four weeks of treatment. After a week of sobriety, the administration of the drug is recommended on the dosage schedule as follows: 2 Gm. on the first day, 1.5 Gm. on the second day, 1 Gm. on the third day, and 0.75 Gm. daily from the fourth to the eighth days. It is important that the complete dose for each day be given in the morning. A trial with alcohol should be carried out on the fourth day by administration of 40 to 50 cc. of whisky to the patient and again on eighth day, on which occasion 30 to 40 cc. of whisky is administered. From the eighth day onward an effort is made to adjust the dosage to that amount which, when 10 to 20 cc. of whisky are taken, produces a slight flushing about the head, a slight increase of pulse rate and mild dyspnea, lasting fifteen to twenty minutes. The daily amount of antabuse necessary to produce such a reaction will vary from one patient to another; the range of dosage is from 0.125 Gm. to 1 Gm. Four to six trials with 10 to 20 cc. of alcohol over a period of four to five weeks should be made to determine the maintenance dose of antabuse which may then be given daily for an indefinite period. A complete study of cellular elements of the blood, urinalysis, recordings of blood pressure and pulse rate, liver function and kidney function tests, determination of acetaldehyde levels in the blood, blood sugar estimations, glucose tolerance tests, a basal metabolism test from time to time and a Rorschach test done before and at intervals during antabuse treatment are suggested as a protection to the patient. Antabuse is a relatively safe drug, provided the rules are observed. It can stop the consumption of alcohol even in heavy drinkers. No habituation to the drug occurs, but sensitivity to alcohol increases somewhat with continued medication. Many patients lose their craving for alcohol after some weeks or months of treatment. The effect of antabuse lasts six to twelve days after the patient stops taking the drug. Close liaison among the physician, relatives, friends and social agencies is necessary for the most satisfactory results. Group therapy such as Alcoholics Anonymous or "Ring in Ring," the Danish organization on the same pattern, are able to provide is an important part of the treatment. Antabuse is not a cure for alcoholism, but should be considered a helpful adjunct to treatment.

South Carolina Medical Assn. Journal, Florence

45:239-270 (Aug.) 1949

Carcinoma of Endometrium: Development of Treatment and Results From the Free Hospital for Women, Brookline, Massachusetts. E. B. Sheehan and A. W. Tucker.—p. 239.
New Concepts in Management of Cerebral Palsy. W. Cook.—p. 248.
Meningitis of Aural Origin: Case Report. R. W. Hanckel.—p. 251.

Texas State Journal of Medicine, Fort Worth

45:545-612 (Aug.) 1949

Nitrogen Mustard in Treatment of Leukemias. W. C. Levin and J. G. Holt.—p. 551.
Megaloblastic Anemia of Infancy. F. M. Taylor and R. A. Hettig.—p. 558.
Health Services for Premature Infant. J. W. Bass.—p. 561.
*Experimental Use of Methyl Testosterone in Premature Infant. G. A. Tittle.—p. 563.
Treatment of Acute Nonsuppurative Thrombophlebitis. D. J. Austin.—p. 565.
Lymphocytic Choriomeningitis: Treatment of 2 Cases with Aureomycin. W. C. Gruter and J. A. Rider.—p. 568.
Accessory Spleen in Scrotum—Report of Case. G. W. Tate and J. L. Goforth.—p. 570.

Methyl Testosterone in Premature Infants.—Tittle treated 18 immature infants with methyl testosterone. The patients received 2.5 mg. by mouth every twelve hours. The drug was given to male and female infants and was usually started when the infant was twenty-four hours old. The treatment was continued until the infant's weight reached 5 pounds (2,268 Gm.), or longer if desired. Early studies indicate that the drug by mouth has no effect on the sex growth of the infant and seems therefore to be perfectly safe. The infants treated with methyl testosterone regained their birth weight more rapidly and also reached the weight of 5 pounds more quickly than was the case without this treatment.

Virginia Medical Monthly, Richmond

76:433-498 (Sept.) 1949

Historical Section: Annual Meeting—Medical Society of Virginia. C. D. Bradley and M. D. Bradley.—p. 436.
Clinical Aspects of Electrocardiography. J. B. Funkhouser.—p. 472.
Rickettsial Diseases of Probable Interest in Virginia. V. A. Turner.—p. 479.
Sakel-Nach Insulin Therapy in Anxiety States. R. F. Gayle Jr., C. L. Reade and Y. S. Chen.—p. 483.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

Australian and New Zealand J. Surgery, Sydney

19:1-96 (Aug.) 1949

Bronchiectasis in Children. T. Y. Nelson.—p. 19.
*Interdigital Pilonidal Sinus. E. S. J. King.—p. 29.
Nerve Sheath Tumours of Vagus Nerve in Neck. M. Paul.—p. 34.
Case of Hydatid of Liver Presenting Some Unusual Features. H. Newland.—p. 38.
Clinical Aspects of Unilateral Renal Ectopia: Report of 7 Cases. J. W. S. Laidley and V. S. Howarth.—p. 40.
Interstitial Cell Tumours of Testis: Male Sex Hormone. K. B. Fraser.—p. 48.
Points in Diagnosis of Labyrinthine Vertigo and Survey of Methods of Treatment, Medical and Surgical. D. G. Carruthers.—p. 58.
Indications for Inducing Fusion at Ankle Joint by Operation, with Description of Two Successful Technics. D. J. Glissan.—p. 64.
Chemotherapy in Intestinal Surgery. K. W. Starr.—p. 72.
Fenestration. E. Gutteridge.—p. 75.

Interdigital Pilonidal Sinus.—King reports 4 patients, all barbers, in whom pilonidal sinuses developed in the interdigital spaces. If barbers are observed at work, hairs are seen to accumulate between the fingers. Once even a small depression is formed the hairs in the region find their way into it. Some of the hairs which become embedded in the skin give rise to an infection, and thus a small opening in the skin begins. If this is just behind the web, one or more hairs will enter it, perhaps only temporarily, but as the result of repeated insults the opening persists and becomes larger. Epithelization of such a depression or pit is a commonly observed phenomenon. Pits of this kind are to be found in various parts of the body. The best known are the sacrococcygeal sinuses, in which there exists a pit of variable depth, lined by granulation tissue or epithelium, containing hair and liable to infection with formation of abcess and secondary sinuses. The prevailing view regarding "pilonidal" sinuses must be broadened: they are found in many areas; the site may vary within an area; they are postnatal in development, there being no apparent embryologic basis for their antenatal development in the interdigital area; they develop in a previously normal area; the hair in the sinus is extraneous.

Brain, London

72:113-264 (Part II) (June) 1949

*Observations on Essential (Heredofamilial) Tremor. M. Critchley.—p. 113.
*Tridione Therapy in Minor Epilepsy. G. R. Davies and J. D. Spillane.—p. 140.
Cerebral Lesions Due to Intracranial Aneurysms. E. G. Robertson.—p. 150.
Quantitative Observations on Olfactory System of Rabbit. A. C. Allison and R. T. T. Warwick.—p. 186.
Experimental "Allergic" Encephalomyelitis. C. E. Lumsden.—p. 198.
Orbital Gyri. E. Sachs Jr., S. J. Brendler and J. F. Fulton.—p. 227.
Observations upon Otological Effects of Streptomycin Intoxication. M. R. Dix, C. S. Hallpike and M. S. Harrison.—p. 241.
Hereditary Stenosis of Aqueduct of Sylvius as Cause of Congenital Hydrocephalus. D. S. Bickers and R. D. Adams.—p. 246.

Essential Heredofamilial Tremor.—According to Critchley essential heredofamilial tremor is not uncommon. Starting at any age, its progression may be slow at first, but in the period immediately preceding old age the tremor may spread and become intensified. The tremor may resemble that of either cerebellar or striopallidal disease. The morbid anatomic basis of essential heredofamilial tremor is unknown. There is a possible remote relationship with Parkinson's disease and also with the presenile cerebellar atrophies. It is conceivable in some instances at least that essential tremor may represent a forme fruste of one or the other of these disorders. An association with palatal nystagmus is encountered occasionally. The occurrence of macrobiotic traits in the families with essential tremor cannot yet be regarded as proved.

Trimethadione in Minor Epilepsy.—Davies and Spillane treated 50 patients, 19 males and 31 females between the ages of 3 and 43 years, who had minor epilepsy, with trimethadione (tridione®). Forty-five patients had periodic minor seizures. In 5 the attacks were psychomotor. Thirty-four patients also suffered from major epilepsy and/or psychomotor attacks. Of patients with minor epilepsy 36 patients had simple petit mal (pyknolepsy), 20 had akinetic attacks and 8 had myoclonic attacks. Treatment was started with one capsule (0.3 Gm.) trimethadione three times daily. In the majority of the patients this has proved to be the optimum dose. The maximum doses employed were 0.6 Gm. of the drug three times daily, a dose which increased the degree of control of the minor epileptic seizures beyond that achieved by the usual optimum dose. Trimethadione has been satisfactory in the treatment of minor epilepsy in 38 of the 45 patients. In 12 persons the attacks were abolished, and in another 15 almost complete control was achieved. In 11 additional patients there was a significant reduction in the incidence of attacks. Five of the 7 remaining patients were improved by trimethadione therapy, but they were still experiencing daily or almost daily attacks. In 2 patients the anticonvulsant was ineffective. Five patients with psychomotor epilepsy were made worse by trimethadione. Minor untoward reactions such as photophobia, mild sore throat or a few papules on the face, chest or arms were not uncommon. In 2 patients there was an urticarial reaction which subsequently developed into generalized exfoliative dermatitis necessitating discontinuation of treatment with the drug. In a third patient treatment was temporarily discontinued following the appearance of facial erythema and edema. At a later date trimethadione was successfully given to these 3 patients without harmful effects. Apart from transient eosinophilia in 4 patients the authors observed no significant alteration in the leukocyte counts. Trimethadione is the most effective substance as yet available for the treatment of minor epilepsy. Although serious toxic reactions sometimes occur, they are not common; in hospital outpatient practice trimethadione is the drug of choice in the treatment of minor epilepsy.

British Journal of Surgery, Bristol

37:1-128 (July) 1949

Treatment of Malignant Obstruction of Cardia. P. R. Allison and J. Borrie.—p. 1.
Leiomyosarcoma of Stomach. K. Watson.—p. 21.
Diagnosis and Treatment of Vascular Diseases with Special Consideration of Clinical Plethysmography and Surgical Physiology of Autonomic Nervous System. R. H. Goetz.—p. 25.
Case of Gastric Carcinoma with Spread Exclusively to Remainder of Bowel and Perianal Skin. G. Lamb.—p. 41.
Pulmonary Embolism Arising from Great Saphenous Vein. E. T. McCartney and A. S. Lewis.—p. 45.
Primary Carcinoma of Trachea. J. F. Pantridge.—p. 48.
Fat Necrosis of Breast with Report of Case in Male. M. Silverstone.—p. 49.
Rare Case of Bone Dystrophy. J. Halliday.—p. 52.
Masked Steatorrhoea Revealed by Pseudo-Fractures (Looser's Zones) with Observations on Calcium Excretion in Convalescence. J. R. Nassim and N. H. Martin.—p. 63.
Non-Specific (Eosinophilic) Granuloma of Bone. R. M. Hill.—p. 69.
Arteriovenous Aneurysm of Great Vein of Galen. H. R. I. Wolfe and N. E. France.—p. 76.
New Method of Venography with Particular Reference to Its Use in Varicose Veins. H. D. Moore.—p. 78.
Duodenal Diverticula. D. Chamberlain.—p. 83.
Rupture of Splenic Arterial Aneurysm as Fatal Complication of Pregnancy. J. A. Chalmers.—p. 86.
New Uretero-Enterostomy. G. C. Thomson.—p. 90.
David Fleming and Operation for Ligation of Carotid Artery. J. J. Keevil.—p. 92.
Sarcoma of Urachus: Report of Case and Brief Review of Subject. R. E. Shaw.—p. 95.
Pancreatic Cysts. M. Paul.—p. 99.

British Medical Journal, London

2:449-496 (Aug. 27) 1949

Goethe, an Appreciation. C. Sherrington.—p. 449.
Streptomycin Treatment of Septicaemia and Meningitis due to Intestinal Organisms in Infants. R. Redhee and P. Mozziconacci.—p. 451.
Streptomycin Treatment of Infantile Diarrhoea and Vomiting. A. Holzel, G. Martyn and L. Apter.—p. 454.
Aetiology of Gravitational Ulcers of Legs. S. T. Anning.—p. 458.
*New Neonatal Syndrome. W. G. Mills.—p. 464.
*Tetraethylthiuramdisulphide in Treatment of Alcoholics. A. E. Carver.—p. 466.
Incidence of Physical Disorders Among Psychiatric In-Patients: Study of 175 Cases. H. E. S. Marshall.—p. 468.
Familial Periodic Paralysis: Report of Case. E. Soya.—p. 470.

New Neonatal Syndrome.—Mills describes a new syndrome that affected infants in the nurseries of the Birmingham Maternity Hospital. He describes 8 cases that were observed in a period of ten months. The chief characteristics include the onset

of vascular disturbances shortly after birth in one or both lower extremities, with a predilection for the gluteal region, and sometimes a flaccid paralysis of the limb. In 1 infant death resulted from cerebral hemorrhage; in another the interior mesenteric vessels were affected, and the child died from peritonitis; in a third there was residual paralysis of the anterior tibial group of muscles. All the others recovered fully. The unilateral bruising of the buttock suggested thrombosis or embolism of the inferior gluteal artery. It was observed that all the infants had been born in a state of white asphyxia and all had required an injection of nikethamide for resuscitation. Speculation was aroused on the possibility that the injection had been given on occasion into an umbilical artery. During the emergency that exists at the time when resuscitation of the newborn infant becomes necessary, an assistant may be instructed to inject nikethamide into the cord, the understanding being that the injection is to be made into the umbilical vein and milked down the cord to the umbilicus. Instead of the usual engorged cord with a prominent distended vein and two smaller encircling arteries, there will probably be a practically avascular structure in which two dark vessels are dimly discernible. The operator, unfamiliar with the appearance of the cord in states of shock, may make the injection by mistake into an artery. The author believes that this accident may have happened before but that the production of a pathologic lesion depends on three factors. First, the volume of injected fluid and the vigorous nature of the milking process will determine how much nikethamide enters the fetal hypogastric arteries; second, the height of the infant's systolic blood pressure will determine how far the retrograde injection advances before being swept peripherally in the arterial stream, and third, the actual pathologic process might be an arterial spasm with ultimate thrombosis similar to the condition in the upper extremity following accidental intra-arterial injection of anesthetic solutions. The author admits that this hypothesis still lacks support.

Tetraethylthiuramdisulfide in Alcoholism.—Carver reports on tetraethylthiuramidisulfide, known under the proprietary terms of antabuse, antabus or antalco, in the combat of alcoholism. The patient should be put to a clinical test before the treatment is begun. After sensitization has been established, alcohol is administered to the patient according to his usual habit when drinking. His reactions then are carefully studied throughout. The use of tetraethylthiumramdisulfide is recommended as a useful ancillary but not as a substitute for general and psychologic methods in the treatment of alcoholic persons.

Journal of Mental Science, London

95:535-784 (July) 1949. **Partial Index**

Psychiatric In-Patient Department for Children. K. Cameron.—p. 560.
Abnormal Behaviour and Mental Breakdown in Adolescence. W. Warren.—p. 589.
Electronarcosis in Treatment of Schizophrenia. L. Rees.—p. 625.
Observations in Electrically-Produced Epileptic Convulsions. Part III: Post-Convulsive Decerebrate State. R. Klein and D. F. Early.—p. 638.
Convulsive Treatment in 56 Tuberculous Mental Patients. B. Jentoft.—p. 651.
Some Observations on Leucotomy and Investigations by Pneumoencephalography. J. F. Donovan, A. J. Galbraith and H. Jackson.—p. 655.
Auditory, Olfactory-Gustatory and Thermic Rorschach Responses. E. Wellisch.—p. 667.
Incidence of Mongolism in General Population. L. S. Penrose.—p. 685.
Comparison of Intelligence Quotient with Behaviour. G. de M. Rudolf.—p. 703.
Paranoid Reaction During Phase of Recovery from Subarachnoid Haemorrhage. M. Silverman.—p. 706.
Porencephaly and Cerebral Abscess Simulating Internal Hydrocephalus. B. H. Kirman.—p. 709.

J. Royal Inst. Public Health and Hygiene, London

12:249-278 (Aug.) 1949

*Occupational Eye Diseases and Injuries. J. Minton.—p. 257.

Occupational Eye Diseases.—Minton deals with the diseases of the lens and retina that occur among glass and furnace workers, welders and others exposed to excessive radiation. The discovery that glass-blowers' cataract is due to infra-red (heat) rays and not, as previously thought, to the ultraviolet rays has led to further studies on its prevention. Glass to which metallic oxides are added can absorb about 90 per cent of heat radiation. This glass, which is dark green, should be used in goggles and protective screens, not dark blue glass, which does not absorb much infra-red radiation. In his investigation of foundries around London the author found that the eyes of the furnace men and foundry men were exposed to the heat of the molten metal but that no eye protection was used by them. Heat cataract is common also among chain makers. The great heat generated by the welding arc is the source of intense infra-red radiation. Some of this radiation is absorbed by the eye, chiefly by the cornea and conjunctiva, but some of it may be absorbed by the lens, which does not lose heat as easily as other parts of the eye; hence, serious injury of the lens may follow. Retinal injuries among welders may vary from slight haziness of the macula to severe edema. Patients may fully recover from mild edema of the macula, but severe burns of the macula have led to complete or partial loss of central vision. A "retinal hole" may be found at the macula in these cases. Burns of the body by high tension electric currents are sometimes followed by cataract. Such injuries occur in electric stations where electricity is either produced or distributed. Injury to the retina may occur also when a workman's eyes are exposed to a sudden electric flash from a high voltage electric current. The industrial use of roentgen rays and the production of radioactive substances demands care so that cataracts will not develop among workers in these industries.

Lancet, London

2:357-400 (Aug. 27) 1949

Opportunity for Adventure. F. A. E. Crew.—p. 357.
The Seven Sins of Medicine. R. Asher.—p. 358.
Contribution of Employment History to Clinical Diagnosis. A. Meiklejohn.—p. 360.
Function of the M.D. Degree. R. Whitehead.—p. 362.
Teaching of Pharmacology in the U. S. A. D. B. Taylor.—p. 365.

2:401-446 (Sept. 3) 1949

Insulin Therapy: Successes and Problems. R. D. Lawrence.—p. 401.
*Guillain-Barré Syndrome or Acute Infective Polyneuritis. C. P. Petch.—p. 405.
Effect of Pentamethonium Iodide on Peripheral Circulation. P. Arnold, R. H. Goetz and M. L. Rosenheim.—p. 408.
Incidence of Staph. Aureus in Anterior Nares of Healthy Children. A. C. Cunliffe.—p. 411.
Serum-Enzyme Changes in Perforated Peptic Ulcer. H. Wapshaw.—p. 414.
Method of Central Sterilisation of Syringes in Hospital. J. Murray.—p. 415.
Ovarian Pregnancy. A. H. Barber.—p. 416.
Simple Oesophageal Cast. J. M. Willcox.—p. 417.
Perforated Jejunal Diverticulitis. G. E. Moloney and J. N. Ward-McQuaid.—p. 418.
Intravenous Procaine for Postoperative Atelectasis. A. H. M. Siddons and E. Landau.—p. 419.

Guillain-Barré Syndrome.—Petch maintains that the description of polyradiculoneuritis by Guillain, Barré and Strohl in 1916, subsequently modified by Guillain in 1936, is identical with that of the acute infective polyneuritis of English workers and the polyneuritis with facial diplegia of Laurens and American writers. Its clinical picture is characterized by symmetric flaccid paralysis with abolition of the tendon reflexes and with subjective sensory symptoms without much objective change. The patients are afebrile but may have had an antecedent febrile illness. The author cites a typical case of benign flaccid paralysis in a woman aged 33. Of the 8 patients reported all showed a symmetric flaccid paralysis involving particularly the proximal muscles of the limbs and extending in severe forms to the cranial nerves, with a predilection for the seventh nerve. Facial paralysis existed in 4 of the 8 patients, but involvement of the other facial nerves is unusual. Increase in the protein content of the cerebrospinal fluid occurs frequently but is not a pathognomonic sign. There are no specific pathologic observations. Polyneuritis and degeneration of nerve roots may be found, with occasional changes in the cord. The cause is unknown, and the infective nature is unproved. Differentiation from poliomyelitis is important and not difficult. Treatment can only be symptomatic. Thiamine hydrochloride is often employed and is harmless, but its efficacy is difficult to evaluate. Some reports emphasize the value of neostigmine, but the author did not observe sufficient benefit from it to encourage him to continue its use. The benefits from physical therapy are obvious. Complete recovery is the rule.

Medical Journal of Australia, Sydney

2:37-72 (July 9) 1949

Coordination of Medical Services in War. S. R. Burston.—p. 37.
Prostate: Commonly Disregarded Principles and Precepts. W. J. Close.—p. 41.
Nitrogen Mustard: Use in South Australia of Methyl Bis (Beta Chloroethyl) Amine. J. Mayo.—p. 47.
"Dead Space" in Closed Circuit Anaesthetic Apparatus: Circuit Absorption Unit of Modified Design. D. G. Renton.—p. 51.
Roseola Infantum (Exanthema Subitum). D. C. Jackson.—p. 52.

2:73-112 (July 16) 1949

Growth and Pathological Processes. P. MacCallum.—p. 73.
Blood Alcohol Content: Aspects of Its Post-Mortem Uses. K. M. Bowden and N. E. W. McCallum.—p. 76.
Observations on Secretion of Stomach with Special Reference to Mucus. S. Weiden.—p. 81.
Doctor's Role in Industry. J. H. Gowland.—p. 83.
Paraplegics Can Walk. O. R. Corr.—p 88
Manual Removal of Placenta: Survey of 201 Cases. W. D. Cunningham.—p. 90.
Case of Refractory Macrocytic Anaemia Responding to Intravenous Iron Therapy. T. D. Hagger.—p. 93.
Acute Carbon Bisulphide Poisoning: Report of 3 Cases, 1 Fatal. D. Gordon.—p. 95.

2:113-148 (July 23) 1949. Partial Index

Control of Hyperthyreoidism by Propyl Thiouracil: Clinical Inquiry. K. Maddox.—p. 113.
Observations upon Group Therapy. P. G. Dane.—p. 127.
Insulin Treatment of Schizophrenia: Ten-Year "Follow-Up." R. R. Webb and M. T. Moall.—p. 130.
Cushing's Syndrome Due to Carcinoma of Adrenal Cortex. K. Maddox, R. Flynn and E. Day.—p. 131.

2:149-188 (July 30) 1949. Partial Index

Fifty Years Survey of Thyreoid Disease at Royal Prince Alfred Hospital, Sydney. E. W. Gibson and H. R. G. Poate.—p. 151.
*Rapid Method of Testing Sensitivity of Tubercule Bacilli to Streptomycin. P. M. Anderson.—p. 154.
Survey of Incidence of Interdigital Fungous Infection in Group of Students from University of Otago. M. J. Marples and M. E. di Menna.—p. 156.
B.C.G. Vaccination Against Tuberculosis. E. A. North.—p 161.

Sensitivity of Tubercle Bacilli to Streptomycin.—Anderson says that hitherto the sensitivity of tubercle bacilli to streptomycin has been ascertained by isolating a pure culture on a solid medium from biologic material such as sputum or gastric washings, then testing it by subculture into several tubes of liquid medium, each containing a different concentration of the drug. This double procedure seldom takes less than two months; it was decided to investigate the possibility of shortening this time by (1) the development of a solid medium into which streptomycin could be incorporated, in order to avoid difficulties entailed in working with liquid cultures; (2) improvement of the method of preparing inoculums from samples of pus or sputum in which the customary technic did not yield homogeneous material, and (3) making possible the inoculation of biologic material directly on the test medium containing streptomycin. It was found possible to use potato agar as a base, enrich it with asparagine, inorganic salts and sterile egg yolk, add an inhibitory dye (malachite green) and streptomycin in the desired amount and so to produce a solid medium which could be stored one month without loss of activity of the antibiotic.

Helvetica Paediatrica Acta, Basel

4:187-344 (Aug.) 1949. Partial Index

Diagnosis of Congenital Angiocardiopathies. M. Grob and E. Rossi.—p. 189.
Significance of Analysis of Gases in Blood in Diagnosis of Congenital Heart Disease. C. Maier and M. Vollmann.—p. 260.
*Examination of Blood in Morbus Caeruleus: I. Plasma and Blood Volume. A. Prader, E. Rossi and M. Wodenegg.—p. 267.
Anomalies of Aortic Arch and Their Embryologic Genesis. M. Grob.—p. 274.
Stenosis of Isthmus of Aorta. M. Grob and M. Stockmann.—p. 294.

Plasma and Blood Volume in Morbus Caeruleus.—Prader and his associates examined the plasma and blood values in 20 patients with morbus caeruleus (congenital cyanosis). Included were 17 with tetralogy of Fallot and 3 with Eisenmenger's complex. A dyestuff technic utilizing Geigy's blue was employed, and the results were compared with those in 23 healthy children. There was an increase of about 65 per cent in the volume of the blood in the patients with congenital cyanosis. This was due to an enormous increase in the volume of erythrocytes, which amounted to 189 per cent. The plasma volume was slightly reduced, the reduction amounting to about 17 per cent. The same changes in volume are found in every case of genuine polyglobulism and in high altitude polyglobulism as well as in polycythemia vera.

Nordisk Medicin, Stockholm

42:1255-1286 (July 29) 1949

Optimal Dose in BCG Vaccination. J. Bøe.—p. 1255.
*Experiments in Induction of Allergy by Inhalation of Allergen. B. Arner.—p. 1257.
Congenital Megacolon. J. Stovner.—p. 1262.
Late Complications After Therapeutic Abortion. N. Svanberg.—p. 1264.
*Toxic Effect of Streptomycin on Eighth Cranial Nerve. Histologic Examinations. K. Berg.—p. 1268.
Balantidial Dysentery. O. Torgersen.—p. 1271.
Diffuse Myxomatosis and Cyst Formation in Lungs. J. Hoel.—p. 1273.
So-Called Alveolar Cell Tumor. K. Lisvaag.—p. 1276.

42:1319-1354 (Aug. 12) 1949

Intestinal Gas and High Altitude Flying. F. Blom Hartvigsen.—p. 1319.
Diagnosis and Therapy in Addison's Disease (Insufficiency of Adrenal Cortex). Importance of Renal Function in Therapy. R. Luft and B. Sjögren.—p. 1321.
*Sulfathiazole Dosage for Children. H. B. Granrud.—p. 1326.
"Lipoblastic Lipoma." I. Qvigstad.—p. 1328

Experiments in Induction of Allergy by Inhalation of Allergen.—Arner says that classification of positive skin reactions as manifest, latent and semilatent has been proposed (Juhlin-Dannfelt and Salén) on the basis of various types of exposure and induction tests. For reliable induction tests strong exposure is necessary. In inhalation tests with strong allergen extracts through a Barach spray he induced asthmatic symptoms in many allergic patients with positive skin reactions. Continuous observation of the variations in the relative oxygen saturation of the blood by the use of an oximeter demonstrated that induced attacks are followed by hypoxia. In a patient with positive skin reactions to horse dander and to ipecachuana root extract, and identical skin titers, asthma developed only on inhalation of the ipecachuana root extract; the patient is believed to have a manifest allergy to this extract, a latent allergy to horse dander. In a patient with semilatent allergy to grass pollen a severe attack of asthma followed inhalation of timothy grass pollen. In both instances epinephrine intravenously given noticeably mitigated the asthmatic symptoms and reduced the hypoxia.

Toxic Effect of Streptomycin on Eighth Cranial Nerve. Histologic Examination.—Berg studied the toxic effect of streptomycin on the vestibular apparatus in cats. He states on the basis of his histologic findings that the point of attack of streptomycin is the sensory epithelium of the labyrinth, not, as previously supposed, the vestibular ganglion and Deiter's nucleus. The changes which have been described in these regions must be regarded as secondary. In 7 of the 8 animals in which the labyrinth has been examined to date the organ of Corti was normal; in the eighth animal, which had received the highest streptomycin dosage, it showed definite changes.

Sulfathiazole Dosage for Children.—Granrud concludes that the best way of determining the dosage of sulfathiazole for children is to base it on the body weight; 0.2 Gm. of sulfathiazole per kilogram of body weight daily usually gives a sulfathiazole concentration in the blood of at least 5 mg. per hundred cubic centimeters, which is sufficiently high and yet less than 10 mg. per hundred cubic centimeters, at which toxic symptoms increase considerably. In some cases 0.15 Gm. of the drug per kilogram of body weight daily may suffice, but 0.1 Gm. per kilogram of body weight daily does not result in adequate blood levels. The preparation is administered four times daily. In dosage based on age attention must be paid to overweight or underweight in the respective age groups and correction made accordingly. The doses named are the usual ones, but in some conditions there are exceptions; in infections of the urinary tract caused by the most common bacteria a sufficiently high concentration of the drug in the urine (50 mg. per hundred

cubic centimeters)*is reached with a lower blood concentration than that previously mentioned and with doses of 0.06 Gm. of sulfathiazole per kilogram of body weight daily.

Paris Médical

2:401-412 (Sept. 3) 1949

*Critical Study of 17 Cases of Brucellosis Treated with Streptomycin Combined or Not with Sulfadiazine. J. Tapié, J. Laporte, Pinel and Monnier.—p. 401.

Streptomycin in Brucellosis.—Tapié and co-workers treated 8 men and 4 women with brucellosis with streptomycin alone, 4 men with streptomycin combined with sulfadiazine, and 1 boy with streptomycin and antibrucellosis vaccine. Streptomycin 1 to 1.5 Gm. was given daily for three to four weeks. Four of the 12 patients treated exclusively with streptomycin were therapeutic failures. One of the 8 patients who recovered had neuro-brucellosis of the quadriplegic type and was given five injections of 0.05 Gm. of the antibiotic by the occipital route and in addition 16 Gm. by the intramuscular route. He showed such spectacular improvement when treatment with streptomycin was started that there could be no doubt that recovery resulted from the drug. In the remaining 7 patients evaluation of the effect of the drug is more difficult because of the spontaneous remissions. Treatment of brucellosis with streptomycin is recommended in patients in whom intravenous vaccine therapy is contraindicated and in those in whom the combined use of vaccine and sulfonamide compounds is not desirable. Three of the 4 patients treated with streptomycin combined with sulfadiazine recovered and 1 was a therapeutic failure. Results in these 4 patients suggest that streptomycin combined with sulfadiazine is more effective than streptomycin alone. Complete recovery resulted from combined treatment with vaccine and streptomycin in 1 patient in whom vaccine alone had induced only temporary remissions. Combined streptomycin and sulfonamide therapy is not superior to intravenous vaccine therapy.

Presse Médicale, Paris

57:773-784 (Aug. 27) 1949

*Physiologic Section of Nerve Root; Spontaneous Recovery Process in Certain Sciaticas. J. A. Chavany, P. Janny and D. Hagenmuller.—p. 773.

Physiologic Mechanism of Irritation Syndrome; Experimental Study. H. Laborit.—p. 774.

*Hereditary Hemorrhagic Angiomatosis and Arteriovenous Aneurysms of Lung. A. Ravina.—p. 776.

Physiologic Section of Nerve Root in Sciatica.—Chavany and co-workers report a man aged 39 with bilateral sciatica. The first attack occurred in 1944 without any trauma. There were two recurrences in 1946 and 1947. Pain was severe on the right side in all three attacks. In December 1948 the patient had severe influenza followed by another recurrence of lumbar pain radiating to the leg, but this time mainly on the left side. Both legs felt heavy. The achilles reflex was absent on both sides. Bilateral surgical intervention was carried out by interlaminar approach on the fifth lumbar and first sacral vertebra. There was herniation of the intervertebral disk on both sides. The nerve root against which the disk protruded on the left side was stretched and adherent. The freeing of it was difficult. The root of the first sacral nerve on the right side was flattened, atrophied, laminated and adherent. The pale and thin nerve root was physiologically deficient with regard to transmission of painful impulses. It could be pinched without producing painful sensation in the lower extremity. Pulling in the course of the operation caused a partial tear of the friable tissue of the nerve root, but this was not accompanied with pain. Physiologic division of the root which had been compressed for a long time by the voluminous disk was responsible for the spontaneous and definite recovery from the sciatic pain on the right side. The residual analgesia emphasizes the fact that all cases of chronic sciatica subside eventually without leaving the patient permanently crippled. This is also true of the protracted cases of sciatica with recurrences.

Arteriovenous Aneurysms of Lung.—According to Ravina hereditary hemorrhagic angiomatosis is not limited to multiple angiomas of the skin and mucous membranes, particularly of the face, and to telangiectases and epistaxis, as described by Rendu and Osler. Visceral angiomas and pulmonary arteriovenous aneurysms have been observed. The aneurysms are responsible for cyanosis, dyspnea, hemoptysis, cough and polyglobulism. These manifestations could be mistaken for those of congenital malformation of the heart. The prognosis of pulmonary arteriovenous aneurysm is not favorable. Surgical treatment is the method of choice for these vascular lesions. Definite recovery may follow a pneumonectomy or a lobectomy.

Revue du Rhumatisme, Paris

16:375-426 (Aug.) 1949. Partial Index

*Kahler's Disease: Clinical and Biologic Study. F. Delbarre.—p. 375.

Myelomas: Histologic Study. J. de Brux.—p. 394.

Coxarthria Following Reduction of Congenital Dislocation of Hip. J. Graber-Duvernay.—p. 403.

Sequels After Irradiation Therapy of Osseous Metastases of Osteolytic Forms of Cancer. P. Lehmann.—p. 406.

Kahler's Disease (Multiple Myeloma).—Delbarre points out that the first report on what is now generally referred to as Kahler's disease or multiple myeloma was made in 1848, when Bence-Jones described his observations on a patient whose urine was of high density, became very opaque when heated, but cleared when heated longer. Autopsy of this patient by MacIntyre disclosed extreme friability of the bones. The disease in this case was designated as osteomalacia. In cases discovered later the disease was referred to as albumosuria of Bence-Jones until multiple tumors of bones were discovered, which were found to consist chiefly of marrow elements; the term multiple myeloma was then applied for the first time. Kahler, in 1889, was the first to establish the connection between Bence-Jones proteinuria and the multiple bone tumors. Delbarre discusses some of the clinical and biologic aspects which he observed in 22 patients. The serum proteins frequently show abberations. Hyperproteinemia, involving particularly an increase in the globulin fraction, is most frequent. Myelomas have been known to develop without noticeable disturbance in the protein fractions. Electrophoretic and fractionation studies on the serum disclosed that the gamma globulins are most frequently increased and the beta globulins more rarely. Occasionally cases of myeloma are encountered in which several protein fractions are simultaneously increased. The globulins which are present in excess are abnormal globulins produced by diseased plasmocytes. These disturbances in the blood proteins are of considerable importance for the diagnosis. They explain the extraordinary increase in the sedimentation rate and the positive reaction to the formaldehyde test, thus aiding one in arriving at a diagnosis.

Semaine des Hôpitaux de Paris

25:2389-2424 (July 30) 1949. Partial Index

*Sensitization Disorders Caused by Streptomycin in Nursing Personnel. L. Justin-Besançon, H. P. Klotz and J. Debray.—p. 2389.

Treatment of Irradiation Lesions Caused by Atomic Explosion. Genaud.—p. 2391.

Biologic Diagnosis of Asthma (Guinea Pig Test). R. Benda and D. A. Urquia.—p. 2395.

Hormone Treatment of Inflammatory Forms of Rheumatism. A. Lichtwitz.—p. 2398.

Sensitization Caused by Streptomycin.—Justin-Besançon and co-workers report 40 cases of sensitization caused by streptomycin in nurses employed in various hospitals and sanatoriums. Neither age nor sex seemed to act as predisposing factors. History did not reveal any previous allergy in 36 nurses. Eosinophilia (an average of 5 per cent) was observed in the 40 nurses. In 24 nurses sensitization disorders occurred one to six months after they had first come in contact with streptomycin. This interval did not exceed ten months in any case. Handling the laundry of patients treated with streptomycin or presence in a ward where streptomycin was handled sufficed to produce or reproduce sensitization disorders in certain nurses. More than half of the nurses had headaches, and 12 complained of vertigo. Pruritus was often limited to the hands and eyelids but was generalized in 8 nurses. Twenty-eight nurses had blepharoconjunctivitis. More than half of them had eczematoid dermatitis, particularly in the peripalpebral region, and 8 had it on the hands and arms. Urticaria or icterus was not observed.

The patch test was positive in all cases, but the skin reaction and the intracutaneous reaction were positive only occasionally. Treatment consists exclusively in the cessation of the handling of the product, or in a change in service. From the legal point of view, the cutaneous manifestations caused by the handling of streptomycin should be classified as occupational disease.

28:2607-2632 (Aug. 22) 1949

Exploration of Glucide Metabolism; Its Application to Study of Chronic Diarrhea. S. Bonfils.—p. 2607.
Research on Acute Renal Insufficiency and Some Actual Methods of Its Treatment. P. Tanret.—p. 2613.
*Treatment of Tremor in Parkinsonism by Peduncular Pyramidotomy. G. Guiot and J. Pecker.—p. 2620.
Effect of Age on Inhibition of Growth by Diethylstilbestrol. F. Bourlière and M. Gourevitch.—p. 2624.

Pyramidotomy in Parkinsonism.—Guiot and Pecker treated 2 men with postencephalitic hemiparkinsonism by section of the pyramidal tract in the cerebral peduncle. The tremor affected the right side of the first patient and the left side of the second patient. Pyramidotomy was performed by subtemporal trephining. In lifting up the temporal lobe one remains strictly within the frontal axis, which leads directly to the base of the peduncle. The incision is then carried in advance of the lateral groove of the peduncle with a slightly curved ophthalmologic bistoury. Follow-up of the patients for one year revealed that the tremor disappeared temporarily in the first patient and permanently in the second patient. A right pyramidal syndrome appeared in the first patient and a left pyramidal syndrome in the second. The contracture predominated definitely over the paralysis in both patients. The paralysis was of definitely "degressive" type; the facial paralysis was more important than that of the upper extremity, and that of the upper extremity was more prominent than that of the lower extremity. The sequelae of the external pyramidotomy manifested themselves by a motor deficiency, which was "degressive" from the face to the lower extremity, contradicting the classic observations of the arrangement of the pyramidal fibers in the base of the peduncle. Although the results of the intervention appeared to be favorable, pyramidotomy should be limited to cases of Parkinson's syndrome with residual tremor after chemotherapy. In contrast to Putnam, the authors believe that bilateral pyramidotomy should not be considered because of the risk of contractures in all four members.

Ugeskrift for Laeger, Copenhagen

111:947-974 (Sept. 1) 1949. Partial Index

*Examination of Duodenum in Diagnosis of Affections of Head of Pancreas. O. Kapel.—p. 954.
Thrombopenia After Allymid (Ethyl-Allyl-Acetyl-Carbamide). H. Graudal.—p. 958.
*Nausea Epidemica. E. Sylvest.—p. 962.

111:975-1020 (Sept. 8) 1949

Electroshock Treatment of Psychoses. V. Lund.—p. 975.
*Lobotomy. Review of Indications for Prefrontal Lobotomy in Psychic Disorders. A. Faurbye.—p. 986.
*Electroshock Treatment of Patients After Lobotomy. O. Ø. Jensen. —p. 992.

Examination of Duodenum in Diagnosis of Infections of Head of Pancreas.—Kapel stresses the importance of changes observed in the duodenum, particularly in the descending portion, in the diagnosis of diseases of the head of the pancreas, whether cancer, chronic inflammation or edema. The changes are those of form, stasis with dilatation of the duodenum, and those of peristalsis. Only roentgen examination with special attention to the descending portion of the duodenum offers hope of early diagnosis. When in doubt while operating, one should verify the diagnosis by microscopic study of a frozen section before radical resection is undertaken.

Nausea Epidemica.—Sylvest reports a small epidemic recently observed which corresponds to the disorder described by Rischel, Heidemann and others. The disturbance set in suddenly with violent nausea and vomiting together with dizziness resembling seasickness, and was over in a day or two. There was no abdominal pain or diarrhea. The incubation period appeared to be less than a week. The author believes that there are hundreds of cases in Denmark, probably also in the neighboring countries, and that on closer examination a maximum epidemic curve in the autumn of the year will be revealed.

Lobotomy.—Prefrontal lobotomy, Faurbye states, is a symptomatic treatment of emotional disturbances. It may be indicated in recent schizophrenia if adequate shock treatment gives only transient effect, in chronic schizophrenia if the patient reacts to an electroshock test, and rarely in hebephrenic schizophrenia. The operation is indicated in catatonic schizophrenia with transient reaction to shock treatment, and it may be indicated in paranoid schizophrenia if the patient is distressed by his delusions and psychotic experiences, especially if personality is well preserved. It may be considered in chronic manic-depressive psychoses which are not affected, or only temporarily so, by shock treatment. Presenile and senile melancholias usually react well to shock treatment; if it fails, as particularly in cases complicated by paranoid features, lobotomy is indicated. Grave invalidizing emotional instability and tendency to dysphoria may be indications for lobotomy. Grave invalidizing neuroses against which adequate psychotherapy is without effect often respond well to lobotomy. In conditions of pain which defy every other treatment lobotomy may give excellent results even when there is morphinism.

Electroshock Treatment of Patients After Lobotomy.—Jensen describes the results of electroshock treatment in 18 cases in which lobotomy gave unsatisfactory results. He believes that lobotomy should not be the last resort. In many cases a temporary improvement of longer or shorter duration can be attained by electroshock treatment. His material does not show what disorders react most favorably to the combination of lobotomy and electroshock therapy.

Wiener klinische Wochenschrift, Vienna

61:497-512 (Aug. 12) 1949

*Treatment of Thromboses with Dicumarol. J. Schmid.—p. 497.
Therapeutic Significance of Paravertebral Procaine Hydrochloride Block in Acute Pancreatitis. A. Vejda.—p. 501.
Hormonal Therapy of Vaginismus. H. Stourzh.—p. 502.
Treatment of Encephalopathies with High Doses of Vitamin B1. E. Urbanitzky.—p. 505.

Dicumarol® in Thrombosis.—According to Schmid the pathogenesis of thrombosis is associated mainly with blood coagulation. Prothrombin plays the most important part in the mechanism of coagulation. Dicumarol® is the best agent for depressing the prothrombin blood level. The author's patients received 300 mg. of the drug on the first day of treatment and 200 mg. on the second. The prothrombin level was thus reduced to less than 30 per cent on the fourth day. Administration of 200 mg. of the drug was repeated on the fifth day. Continuation of the treatment depends on the prothrombin time. In addition one must consider the cumulative effect of dicumarol® and the danger of acquiring a tolerance for the drug. Dicumarol® proved particularly effective in preventing postoperative thromboses. Graphic records of the prothrombin time demonstrated that the prothrombin level rises on the third postoperative day. That is the time when dicumarol® treatment should be instituted. The author cautions against the use of the anticoagulant before or immediately after surgical operation, because of the risk of profuse hemorrhage. Administration of dicumarol® is particularly contraindicated in surgery of the brain and the spinal cord, in which even slight bleeding may be dangerous. Rapid alleviation of pain, shortened healing time and reduced danger of embolism favor the use of dicumarol® in the treatment of acute thrombosis. In coronary thrombosis treatment with dicumarol® should be instituted on the fourth or fifth day of the disease because of the acute deterioration of the cardiac condition which had been observed when the drug was given at the start of the infarct. Dicumarol® proved effective in the treatment of thrombosis of small vessels in patients with typhus. The mortality of those treated with aminopyrine combined with dicumarol® was 7.1 per cent as compared to 18.6 per cent in the patients treated with aminopyrine alone. The exanthem disappeared more rapidly when dicumarol® therapy was instituted earlier.

Book Notices

THE REVIEWS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES AND DO NOT REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED.

Celebration of the Sesquicentennial of the Medical and Chirurgical Faculty of the State of Maryland 1799-1949. Cloth. Pp. 67, with 17 illustrations. Medical and Chirurgical Faculty of the State of Maryland, 1211 Cathedral St., Baltimore 1, 1949.

This is a brief history of the first 200 years of the Maryland state medical society. Its "quaint, old-timey name," the only one of its kind among the state medical societies, and its pride originated in the medieval University of Paris, where medical graduates became the distinctive faculty. One hundred and two years after the Medical and Chirurgical Faculty of the State of Maryland was founded, a proposal to change the historic name to that of the Maryland State Medical Society was voted down. As with many other medical societies, the stimulant that led to the formation of the Maryland society was the desire of the better educated physicians to promote and disseminate medical knowledge and prevent the citizens of Maryland "from risking their lives in the hands of ignorant practitioners or pretenders to the healing art." When the founders group obtained a charter in 1799, the opposition to this movement claimed that it was "an effort to set up a monopoly and confine the benefits of medical practice to a select few." This false premise is still being used today by those who would curtail the efforts of organized medicine to promote the science and art of medicine and the betterment of public health. Dr. Upton Scott of Annapolis was unanimously elected the first president of the Medical and Chirurgical Faculty of the State of Maryland; he was 77 years of age. Since that time this organization has enrolled many famous physicians among its members, William Osler, perhaps, being the most widely known. Osler's oration, entitled "Old and New," given at the dedication of Osler Hall in the society's new building in 1909, contained the following closing paragraph:

"The best of all old things about this Faculty is that subtle force by which the men of the past influence us today, not by tradition, by the spoken word handed on from father to son, teacher to pupil; not by the written record in which one generation reads the deeds of another; but by that intangible, mysterious force, hard to define but best expressed by the words *noblesse oblige*—that obligation to act in a certain way, to foster certain habits, to conform to certain unwritten laws—a sacred obligation, as potent now as in the time of Hippocrates, the alchemy of which at once turns to gold whatever may be leaden in the new of today."

This book reveals some of the difficulties in the early days in carrying out the society's objectives. The College of Medicine of Maryland, authorized by the state legislature in 1807, was a creature of the Medical and Chirurgical Faculty of the State of Maryland. A few years later the College became a part of the University of Maryland. The Medical and Chirurgical Faculty has been not only a scientific society all through these years, but also a civic body with a special responsibility to the state administration and a guide in matters of health which gravely concern the welfare of the citizens of the state. The society has long since owned and expanded its own home and founded an outstanding medical library. The various chapters of this small volume each cover a definite period, some 10 years, some 20 and others 40 years. It is disappointing to find so little space devoted to the Johns Hopkins Hospital and medical school, from which the Medical and Chirurgical Faculty of the State of Maryland has derived part of its strength; there is a picture of this institution in which the state medical association was invited to hold some of its annual meetings. There are pictures of the society's proposed new building which will adjoin the present home of the society and allow an expansion of the library and contain a new auditorium. This interesting historical account closes with a list of the presidents and the 50 year members of the society.

La vectocardiographie: Méthode d'exploration du champ électrique créé dans le corps humain par les courants d'action du cœur dans les conditions normales et pathologiques. Par Pierre W. Duchosal, chargé de cours de cardiologie à l'Université de Genève, et Robert Sulzer, privat-docent de physiologie à l'Université de Genève. Edition spéciale du Fasc. 3 de la Bibliotheca cardiologica. Paper. Price, 25 Swiss francs. Pp. 172, with 88 illustrations. S. Karger, Holbeinstrasse 22, Basel, 1949.

This excellent monograph is the result of more than ten years' studies on the distribution of the electrical field within the human body. The vectogram (VG) is said to express the complex electric phenomena of the heart more completely than the classic electrocardiogram. Theoretically, it indicates the spatial orientation of the average direction and, by its length, the algebraic sum of all the electromotive forces of the heart acting in any instant. The apparatus used by the authors is described. The "bipolar" method was employed, with leads in three planes, frontal, sagittal and horizontal, with one point in common, located in the right lower and posterior part of the torso. In the "unipolar" method, the vectogram is obtained by a combination of unipolar leads in the vertical, sagittal and transverse direction along lines which connect the center of the heart (determined by fluoroscopy) with the electrode.

The errors involved and the unwarranted assumptions implied make these methods merely a crude approach to the problem. They are at present as good as can be expected. It is unfortunate that the authors use a polarity which is the reverse of that ordinarily employed, with the result that patterns are produced which appear upside down.

Standard and V limb leads constructed from the vectogram agree fairly closely with those actually obtained in the same patient, and this was true also for the V chest, the esophageal and the intracavity leads. The authors conclude from this that the chest leads represent not only the surface potential of the region underlying the electrode but actually record all the electromotoric forces created within the heart. Similarly, the usual explanation of the QS deflection in anterior wall infarction as a transmission of intracavity potentials to the electrode and the concept of the "intrisicoid deflection" as due to alteration of surface potentials are both considered unjustified. The pattern of a V lead is determined not by the distance of the electrode from a certain surface of the heart but by the direction of all instantaneous vectors generated within the heart as viewed from the particular projection. This concept will undoubtedly upset many American students in the field.

In the last part of the book, the authors describe some normal and abnormal vectograms. Right ventricular hypertrophy does not change the pattern so much in mitral stenosis as in chronic cor pulmonale. However, the electrocardiogram of the latter, illustrated in figures 48 and 57, is in reality a right bundle branch system block pattern. Left ventricular hypertrophy is indicated by the changed direction and the late appearance of the summit of the QRS loop and by the development of the T loop in an opposite direction. With eccentric hypertrophy (as in aortic insufficiency) an extension of the QRS loop over the frontal plane may be registered.

The vectogram in right bundle branch system block consists of a primary, more or less normal part (left ventricle) and a second, opposite, part due to activation of the septum and the free wall of the right ventricle. The electromotive forces of these two parts, as calculated from the vectogram, are in approximately a 4 to 1 relationship. Contrariwise, a fundamental change of the vector loop occurs in left bundle branch system block. It develops mostly in the frontal and sagittal direction, while, in contrast to the normal vectogram, it is much shortened in the vertical direction. Its initial part resembles, as far as direction and chronology are concerned, that seen during the last part of the loop in right bundle branch system block. Vectors of ventricular premature systoles show a pattern different from that of bundle branch system block and may resemble a normal vectogram with changed chronology of electrical effects.

Examples of recent and old infarcts show various patterns. There is usually a change in the relationship of the size of QRS and T loops (decrease of the former or augmentation of the latter). In anterior infarction, the loop often develops in a more sagittal direction.

Studies of 8 cases of Wolff-Parkinson-White syndrome (4 illustrated) permit the authors to assume that the premature component, unlike the rest of QRS, represents the unopposed and true direction of the impulse producing the pre-excitation.

Written clearly and concisely and well illustrated, the book can be recommended without hesitation to all interested in theoretical and practical electrocardiography. Vectorcardiography applied in such a systematic fashion will certainly contribute a great deal to the solution of many unsolved or misunderstood problems of electrocardiography. It is not expected that all will agree with the conclusions, but the authors are serious students and their work will stimulate thought and discussion.

A Century of Medicine in Jacksonville and Duval County. By Webster Merritt. Cloth. Price, $3.50. Pp. 301, with 66 illustrations. University of Florida Press, College of Law Building, Gainesville, Fla., 1949.

The Floridas were ceded to the United States by Spain on Washington's birthday in 1819. Jacksonville, which was founded in 1822, was named in honor of General Andrew Jackson, a provisional governor of Florida. Duval County was created in 1822. In 1936 the author of this small book began the practice of medicine in Jacksonville. His interest in the medical history of Northeast Florida was aroused in part by the fact that his great grandfather practiced medicine in Jacksonville late in the nineteenth century; however, the first bona fide American physician to practice medicine for an extended period in Florida is said to have been James Hall, who went there about 1798 after having served in a New Hampshire regiment in the Revolutionary War. Dr. Hall's death, in 1837, left Duval County without medical attention for about a year; then Dr. Abel S. Baldwin began his long and distinguished career in Jacksonville. The Florida Medical Society was founded at a meeting in Dr. Baldwin's home in 1874. Brief biographies of several early physicians in Duval County are presented; other chapters are devoted to the yellow fever epidemic of 1857, yellow fever in Jacksonville, 1877, yellow fever in Fernandina (a neighboring city), the yellow fever epidemic of 1888, epidemic of dengue, the smallpox epidemic of 1883 and a cholera epidemic in 1866. The Florida University Medical School, organized in Tallahassee, was disapproved by the Florida Medical Association at its annual meeting in 1885, and the medical department of the University ceased to exist in the following year. A chapter is devoted to the founding of the State Board of Health in 1889 following public demand rising out of the yellow fever epidemic of the previous year. This book reveals the tribulations and hard work of the pioneer medical men of Florida. There are numerous illustrations made from rare old photographs. The author has served as president of the Jacksonville Historical Society and vice president of the Florida Historical Society.

Child Psychiatry. By Leo Kanner, M.D., Associate Professor of Psychiatry, the Johns Hopkins University, Baltimore, Md. With prefaces by John C. Whitehorn, M.D., Henry Phipps Professor of Psychiatry, Johns Hopkins University, Adolf Meyer, M.D., LL.D., and Edwards A. Park, M.D. Second edition. Cloth. Price, $8.50. Pp. 752. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1948.

This second edition of Dr. Kanner's comprehensive textbook, with prefaces by Drs. John C. Whitehorn, Adolf Meyer and Edwards A. Park, is extensively rewritten. In its present form the book reflects the considerable advances that have been made in the integration of psychiatric thinking and pediatric perspective. The author, as associate professor of both pediatrics and psychiatry at the Johns Hopkins University, has been close to and has played his own important part in bringing about this integration. One is impressed with the evidence of broadening and deepening of the author's approach to the problems of childhood health and illness since the first edition of this work was published. The historical review of child psychiatry with which the book opens offers the student a first orientation that will enable him to relate his work in child psychiatry to the several disciplines involved in a modern approach to problems of childhood. If the author's statement, "While the fundamentals of child psychiatry are now taught in every accredited school of social work, the number of medical schools giving such instruction can be counted on the fingers of one hand," is still anywhere near correct, his initial orienting efforts are particularly useful.

This is the most comprehensive and useful textbook on child psychiatry available—indeed, the only one of its order. Its virtues as a textbook are many. The student will find excellent discussion of the clinical problems in which he is interested presented against a sound background of awareness of psychologic, physical and general or specific environmental factors in the occurrence of symptom or illness. The general orientation it offers as to psychotherapy is suggestive and stimulating rather than comprehensive. It is well suited to the orientation of the pediatrician and others who must meet the problems of childhood, but the child psychiatrist may look for more specific dynamic psychologic formulations than can be presented in a textbook covering as wide a field as does this one.

While there is still a lack of what was referred to in a review of the first edition of this book as "synthesizing psychology" to integrate the discussion of personality development and to give more clarity to the at times too loosely dealt with concept of "emotional disturbance" as contributing to illness or symptom, the author's sound clinical perspective and his broad grasp of his subject make this an excellent book. The bibliography includes works offering the more comprehensive discussions of psychodynamics and psychotherapy that the child therapist may wish. The book should be available to all medical students and should be used for pediatric as well as psychiatric instruction.

Child Development: Physical and Psychological Growth Through the School Years. By Marian E. Breckenridge, M.D., Head of the Physical Growth Department, Merrill-Palmer School, Detroit, Mich., and E. Lee Vincent, Ph.D., Dean of the New York State College of Home Economics at Cornell University, Ithaca, N. Y. Second edition. Cloth. Price, $4. Pp. 622, with 43 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London W.C. 2, 1949.

If there were any complaint about this revised edition, it would be that too few parents will see it. The insight and understanding provided by the authors serve tremendously to improve appreciation of the many factors controlling the supposedly simple and more or less automatic growth of the child. As the authors state, however, a child both "grows" and "grows up," and their approach to the subject shows their full appreciation of the complexities involved.

Written primarily for class room use, the book contains fifteen chapters, of which the first presents general principles of developments and the final chapter provides a summary of growth achievements, with preadolescent and adolescent case studies. This method of presenting concrete examples is followed from time to time throughout the book and is undoubtedly of much practical value. The first part of the volume deals with influences on growth, including physical, emotional, nutritional, home and community influences. Later chapters are concerned with special details of the growth phenomenon, such as development of motor control, personality and moral judgment. Among outstanding chapters is the one on nutrition, which contains a table of recommended dietary allowances. Especially well done also is the chapter on external influence on growth, including the home and school. In the succeeding chapter the point is made that not all influences of movies are bad, and the same is concluded for the "comics," dominant reading preference of children.

Inclusion of a series of questions for class study at the close of each chapter enhances the practical value of the volume, as does the list of selected readings following each chapter. A bibliography of 1,089 items testifies to the thoroughness with which the authors have surveyed the field. Physicians will find the book of value both as a reference source and as a practical aid to understanding and appreciation of many of the problems brought to them by parents.

Précis des maladies allergiques. Par Pasteur Vallery-Radot, professeur de Clinique médicale à la Faculté. Paper. Price, 550 francs. Pp. 223, with 11 illustrations. Ernest Flammarion, 26 rue de Vaugirard, Paris 6e, 1949.

According to the author the need for this book arose from the fact that there exists in France no general treatise on allergic diseases and that too many clinicians are inclined to ignore allergy while too many allergists do not consider the pathology of allergy. The book is divided into eight sections and twenty-

seven chapters, some of which are less than a page in length. The different sections take up the following subjects: experimental anaphylaxis, anaphylaxis in man, general principles of allergy, allergic manifestations in different organs, drug allergy, allergy of a special character, pathologic anatomy of allergic reactions and treatment. The text is well organized and the subject well covered considering the size of the book, although of necessity much detail could not be presented.

To the French or European reader this small volume will serve as an introduction to the field of allergy, which should be followed by a more extensive treatise covering the subject. To the American reader the volume is of interest because it gives him a clearer insight into the status of allergy and its practice in France. For example, we are told that it is rare to see hay fever before the age of 10 and that only 10 per cent of patients with asthma are allergic. Such conditions, so unlike those encountered in the United States, require a different approach. It is not surprising, therefore, that the author discourages desensitization and emphasizes nonspecific therapy and elimination of allergens. Professor Vallery-Radot, a pioneer in the field of allergy, has succeeded in his undertaking to introduce allergy to the French profession.

The Therapeutic Value of Streptomycin: A Study of 3,000 Cases. By Chester S. Keefer, M.D., Professor of Medicine, Boston University School of Medicine, Boston, and William L. Hewitt, M.D., Instructor in Medicine, Boston University School of Medicine. Fabrikoid. Price, $7. Pp. 299. J. W. Edwards, 300 John St., Ann Arbor, Michigan, 1948.

This volume presents the complete and exhaustive data gathered by the Committee on Chemotherapy of the Division of Medical Sciences of the National Research Council during the course of investigations which they sponsored on the therapeutic value of streptomycin. The work was started early in 1946, at a time when streptomycin was limited in supply and its extent of usefulness relatively unknown. Over a six month period, data on nearly 3,000 patients was collected, and this volume presents a critical analysis of these cases.

Because of the short supply of the drug and because of other investigations already under way, the effect of streptomycin in tuberculosis was not included as part of the investigative program. However, the other uses of streptomycin are adequately covered.

The data are arranged according to organ systems affected except for such diseases as tularemia, typhoid and brucellosis, which are discussed in separate chapters. Toxic reactions are well discussed in the last chapter. Much tabular material is included, and specific cases are discussed when they illustrate an important exception to the usual response or are otherwise unusual. In most instances, a summary of the committee's opinion regarding the value of streptomycin in each condition is given at the end of each section.

Although this work was performed in the early days of streptomycin, it forms the basic information on which present day use is predicated. It is interesting to note that the conclusions expressed by the committee need little, if any, revision in the light of experience accumulated in the past three years.

This volume may be regarded as an authoritative source of information on the use of streptomycin, of value to every practicing physician. It illustrates vividly what can be accomplished by a systematic, cooperative, voluntary investigation of a new therapeutic agent.

Diseases of the Nose and Throat: A Textbook for Students and Practitioners. By Sir St. Clair Thomson, M.D., F.R.C.P., F.R.C.S., and V. E. Negus, M.S., F.R.C.S., Surgeon for Diseases of the Throat, Nose and Ear, King's College Hospital, London. Fifth edition. Cloth. Price, $10. Pp. 1004, with 413 illustrations. D. Appleton-Century-Crofts Company, Inc., 35 W. 32nd St., New York 1, [n.d.].

This monumental work, first published by Sir Thomson in 1912, retains all of the conservatism of literary and scientific presentation under the present aegis of Dr. V. E. Negus. Careful sifting and elimination of material which seems redundant or made obsolete through the progress of the specialty has been the present author's purpose. The gap of the literary scarcity of the war years has been only partially closed, and further elimination of antiquated approaches requires the attention of the author, together with a more modern approach to therapy, both medical and surgical. The use of streptomycin in tuberculosis is not mentioned, and syphilitic treatment with penicillin receives but passing mention.

The thirty pages devoted to syphilis contain many historically interesting facts about management, but the author fails to bring the situation up to date. As could be expected, better coverage is given the larynx, trachea, bronchi and esophagus than other anatomic sites. In critcally appraising so large a work, one is reminded of a quotation of Samuel Johnson which Sir Thomson included in the preface to his third edition, "In this work, when it shall be found that much is omitted, let it not be forgotten that much likewise is performed."

Jordan-Burrows Textbook of Bacteriology. By William Burrows, Ph.D., Professor of Bacteriology, Department of Bacteriology and Parasitology, the University of Chicago, with the Collaboration of Francis Byron Gordon, Ph.D., M.D., Richard Janvier Porter, Ph.D., Associate Professor of Parasitology, School of Public Health, the University of Michigan, Ann Arbor, Mich., and James William Moulder, Ph.D., Assistant Professor of Biochemistry, Department of Bacteriology and Parasitology, the University of Chicago. Fifteenth edition. Cloth. $9. Pp. 981, with 264 illustrations. W. B. Saunders Company, 201 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C. 2, 1948.

The value of this textbook to the teacher and to the student of medical bacteriology has been established through its successive editions. The tremendous task of incorporating recently established scientific data in a volume of this kind is seldom appreciated by the student. The authors have revised several sections; these include discussions on respiration and carbohydrate metabolism, mechanisms of antibacterial action, hypersensitivity, the streptococci, bacterial variation and the effects of radiation on micro-organisms. New sections on Donovan bodies, rickettsialpox and infectious hepatitis are included.

The revised chapter on laboratory methods "is not intended to be exhaustive, but rather to include only the majority of the common laboratory procedures which the student will use, and to make available to him specific information concerning them." The chapter is brief, and the practical value of some of the procedures included is dubious.

The increasing cognizance of relationships between the biologic sciences is reflected in the chapters on bacterial physiology; effect of physical and chemical agents on bacteria, and bacterial heredity and variation. Brief chapters on medical mycology and parasitology are included, in keeping with the standard format for textbooks on bacteriology.

An Epitome of the Laboratory Diagnosis and Treatment of Tropical Diseases. By Horace M. Shelley, F.R.F.P.S., M.R.C.P., D.T.M. & H., Director of Medical and Health Services, Cyprus. Second Edition. Cloth. 25s. Pp. 147. Staples Press Limited, Mandeville Place, London, W. 1, 1949.

The first edition of this book, published in 1930, was reviewed in THE JOURNAL, June 27, 1936. The second edition is slightly expanded, but its extreme brevity fails to provide the user with adequate information. The author's aim to provide the busy practitioner with simple facts applicable to tropical medicine is done at the expense of omitting too much essential information. The sections devoted to blood cell counts, hemoglobin estimation and color index are not peculiarly applicable to tropical medicine. On the other hand, staining technics peculiar to hematologic diagnosis might be expanded with illustrations of the staining reactions of specific micro-organisms concerned. The accurate species diagnosis of malaria by blood films is not simple and probably is seldom achieved without extensive experience. The uncolored diagrams on page 29 showing the various forms of plasmodia falls short of teaching the staining and morphologic variations of these parasites. The description, on page 21, of the Ide test for syphilis and yaws conveys the impression that it is specific for only these two possibly related diseases, whereas such serologic tests for syphilis frequently give false positive results in malaria and other conditions encountered in the tropics. The inexperienced would certainly be misled as to specificity of this type of test.

The book follows British preferences in spelling and disease nomenclature. It is replete with British pharmacopeial and trade names for drugs, with which there is not universal familiarity. The choice of agents mentioned in connection with treatment is not sufficiently critical; a few already discarded forms of treatment are mentioned, for example, chaulmoogra oil for leprosy.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SINGER'S NODES

To the *Editor*:—A patient has had a small tumor removed three times from the posterior third of the left vocal cord. The first pathologic report gave a diagnosis of leukoplakia, or singer's nodo, but the next two pathologic diagnoses were inflammatory granuloma. This growth has been reappearing in about three to six weeks, and now after only two weeks it has recurred. The patient, age 57, experiences practically no discomfort, and his voice has not changed. What treatment is indicated for the radical removal of this growth?

F. Vela Gonzalez, M.D., Monterrey, Mex.

ANSWER.—The three different terms used synonymously in this inquiry do not represent the same thing but constitute three distinct pathologic conditions of the larynx. Vocal nodules, or singer's nodes, are invariably found at the junction of the anterior and middle thirds of the vocal cords, and they appear as small fibrous nodules on the cordal margin. Although most often bilateral, they may occur on just one cord. Histologically, these nodules have a fairly consistent pattern, showing fibrous inflammatory tissue and some loose vascular tissue, generally covered with thickened epithelium, the stroma consisting mainly of fibrous connective tissue. Removal of the nodules, with the subsequent proper use of the voice, offers a favorable prognosis for cure.

Leukoplakia of the larynx is characterized by whitish patches on the surface of the mucous membrane. This may be limited to one cord or may be bilateral. As a rule, the entire length of the vocal cord is involved. In some cases the epithelium becomes decidedly thickened and shows hyperkeratosis. Removal of the surface patches reveals them to have the configuration of whitish flat scales. Repeated removal of the redundant tissue may be necessary. Possible transition to a malignant phase should always be kept in mind.

Contact ulcer of the larynx is a chronic lesion characterized by an ulcer-like appearance located on the vocal process on one cord and more frequently on both cords. This condition appears to be due to the constant friction of the one cartilaginous vocal process against the other, which causes trauma to the mucosal covering. There are various stages of this condition, which may range from hypertrophy of the vocal process, with the mucous membrane intact on the surface, to the stage where definite ulceration of the mucous membrane occurs. In the latter condition a shallow ulcer is usually seen covering the perichondrium in its bed. In many instances a small mass of chronic granuloma covers the entire ulcer. In bilateral conditions these ulcers may have the appearance of small cups with a rim of granulating tissue due to the persistent trauma with each act of phonation. If these ulcers are not properly removed, they will have a tendency to recur repeatedly. The granulomatous tissue should be cut off superficially, as in the removal of vocal nodules. If undue trauma is produced to the cartilage of the vocal process in the removal of this granulomatous tissue, there would be a tendency to recurrence, because of the difficulty in healing of the underlying structures.

In all these conditions the important aspect of differential diagnosis is elimination of the possibility of these changes being due to a malignant involvement. Histologic examination of the tissue by a competent pathologist is extremely important. The avoidance of vocal abuse and the elimination of irritants, such as smoking, that may be contributing factors, are also important in the successful treatment of these conditions.

LIQUID PETROLATUM

To the *Editor*:—Are there any carcinogenic properties in liquid petrolatum (mineral oil)? A patient of mine uses it to relieve discomfort caused by rhinitis atrophicans. For years he has applied it to the nasal mucosa several times daily with a glass rod.

M.D., Wisconsin.

ANSWER.—There are no known carcinogenic properties in liquid petrolatum. Closely related petroleum products have been found to be carcinogenic under certain conditions. There are no reports of tests for carcinogenicity of some American petroleum and shale oils. Carcinogenic properties may occur naturally in some petroleum products, and others are products of conversion during manufacture.

ROENTGEN THERAPY FOR STERILITY

To the *Editor*:—What is the efficacy of roentgen therapy for sterility, with small stimulating doses given to the ovaries and pituitary? What is the accepted technic? Are there any ill effects from such treatment?

M.D., Connecticut.

ANSWER.—The results of high voltage roentgen therapy in the treatment of amenorrhea and sterility have been good. Ira I. Kaplan (*Am. J. Roentgenol.* **59**: 370 [March] 1948) treated 334 women in twenty-one years for amenorrhea and sterility; 33 were unmarried and 301 were married. Follow-up examinations were made of 274 patients; 12 unmarried and 48 married patients could not be traced. The results were good in 12 unmarried and 198 married women. Of the married women, 90 became pregnant and carried to term, delivering 101 normal children, of which 45 were boys and 56 were girls. Four women were pregnant at the time of the report. About 30 per cent of the women had more than one child. Repetition of treatment was not advised. Della G. Drips (*Am. J. Obst. & Gynec.* **55**: 789 [May] 1948) reported a series of women with ovarian dysfunction treated with low dosage irradiation. Of 123 young married women given this form of treatment, 34 became pregnant directly after the therapy. Eighty-two stated that their menstrual periods were definitely more regular after treatment and, of these, 45 became pregnant and had sixty-seven full term pregnancies, ten abortions and two ectopic pregnancies. One patient gave birth to a monster after full term gestation. Twenty-two women with regular normal menses were given low dosage irradiation over the pituitary gland and ovaries for sterility. Eleven were also given pregnancy serum, and 5 received estrogen and progesterone. Three became pregnant, but only 2 immediately after treatment. Six complained of irregularity of the menstrual periods after the therapy. On the basis of these results, Drips does not advise use of low dosage irradiation for sterility alone. In C. Mazer and R. Greenberg's extensive experience (*Am. J. Obst. & Gynec.* **46**: 648 [Nov.] 1943) 44 per cent of the sterile women conceived, carried to term and bore healthy babies.

In Kaplan's treatment the factors were 200 kilovolts, 4 to 5 milliamperes, 0.5 mm. of copper, plus 1 mm. aluminum filters and 50 cm. target distance. The first day 50 r was given to the anterior right and left ovarian fields and 75 r to the anterior pituitary area; one week later 75 r was given to the anterior pituitary area and the posterior right and left pelvic ovarian fields; one week later the anterior pelvic ovarian fields were given 50 r and the anterior pituitary field 75 r. All doses were measured in air. Milliamperage must not be above 10, and the dose into the ovaries must be between 10 and 14 per cent of the given dose. The younger the patient, the better the results.

Drips' technic was as follows: One field over each temporal region, centering over the pituitary, and two fields over the front of the abdomen, centering over each ovary, were irradiated. The factors were: 200 kilovolts, 20 milliamperes, 0.75 mm. copper and 1 mm. aluminum filters 50 cm. distance for five minutes. This is about one sixth of a skin erythema dose.

There is no unanimity concerning the harmlessness of roentgen ray therapy to overcome sterility. Greenhill made the following statement (Greenhill, J. P.: Year Book of Obstetrics and Gynecology, Chicago, The Year Book Publishers, Inc., 1948, p. 528), "F. Crainz (L'irradiazione dell'ovaio e la sua azione sulla discendenza, *Ginecologia* **12**: 383, 1946) made a very extensive study of the literature on this subject. He found that in nearly all experimental irradiation of plants, insects and small mammalia it is possible to bring about true mutations, which are always of the recessive type and never result in the improvement of the race. Crainz collected from the literature 1,305 cases of pregnancy in women previously treated by gamma rays. In 149 outcome of pregnancy is not known. Of the remaining 1,156, 29 ended in premature delivery and 275 in abortion; 5 were ectopic pregnancies. Among 852 newborn full term babies and 23 prematurely born, abnormalities occurred in 21 (2.6 per cent). This seems to be a large number, but in four cases the women were probably pregnant at the time of irradiation. The author concludes that although no one can now say with certainty that irradiation can cause hereditary anomalies in humans, it is equally impossible to deny this eventuality. Crainz warns that we must reduce to an absolute minimum all diagnostic and therapeutic x-ray or radium irradiation to the pelvic area in women still capable of becoming pregnant."

In 1943 Greenhill (Greenhill, J. P.: Year Book of Obstetrics and Gynecology, Chicago, The Year Book Publishers, Inc., 1943, p. 508) said, "In the past, I, among others, have urged great caution with low dosage irradiation because of the reports in the literature, chiefly those of Muller, of serious harm to the offspring in the third and fourth generations in various species of animals. In human beings the offspring have been normal,

but as this treatment is less than 20 years old no one knows what will happen to the third and fourth generations. However, in a personal communication William Snow writes he calculated that according to Muller all life should have been destroyed by cosmic irradiation, since in a million years about 50,000 r of such energy reached the earth's surface, as judged by the Geiger-Muller readings. We must conclude therefore that there must be a recovery of the genes. Gordon and Sang have prevented with niacin fruit fly mutations induced with irradiation. According to Snow, this is practical proof that the genes can recover from radiation injury."

In an editorial comment Greenhill said (Greenhill, J. P.: Year Book of Obstetrics and Gynecology, Chicago, The Year Book Publishers, Inc., 1948, p. 529), "H. J. Muller, in a talk on 'Radiation Damage of Genetic Origin' at the University of Chicago said that important damage to the individual can result from a repetition of doses far too small to produce such obvious effects as reddening of the skin, loss of hair, changes in the blood count or other signs previously used in calculating harmful effects from radioactive substances. He said that in addition to changes taking place naturally in the genes, radiologic damage produces alterations in these invisible particles and that most of these changes are in some way harmful. The radiation dose received by a person during a single x-ray examination of the abdomen probably is sufficient to cause as many changes in the genes as would occur naturally in the course of the individual's reproductive life. He also said that each such dose probably carries about a 10 per cent chance of handicapping or killing a descendant in some (usually remote) future generation. These are strong words but they show what one prominent geneticist thinks about the use of x-ray to overcome amenorrhea and sterility in women. Even if we do not agree with Muller and others, we should surely be very careful in selection of patients for such therapy."

PREDETERMINATION OF SEX OF CHILDREN

To the Editor:—I have been asked, by parents who want to "round out their families," about predetermination of the sex of children. One had heard about "hormone injections"; the other had a book that mentioned acid and alkali douches. (1) What is the present status of these theories? (2) Are there deleterious effects from these treatments?

M.D., New York.

ANSWER.—1. The sex of a child cannot be selected. Hormone injections do not have an effect on the predetermination of sex, nor does variation of the p_H of the vagina.

Deryl Hart and James D. Moody (*Ann. Surg.* **129**:550 [May] 1949) reported an experimental breeding of rats in which they increased the percentage of male offspring as compared with female from a normal of 100.1 to percentages varying from 149 to 255. This was accomplished by delaying insemination after the expected time of ovulation; the percentage of male offspring increased directly with the increase in the time interval. An analysis of over 65,000 pairs of human dizygotic twins reveals in each year's group about 27 per cent more like-sexed than unlike-sexed pairs. On the basis of their experimental studies, the authors feel that this constant surplus, inconsistent with chance alone, results from inseminations occurring both early and late in the fertility period. On the basis of their experiments and a statistical analysis of large numbers of human twins, they believe that the time factor between insemination and ovulation directly influences the sex of the offspring.

Hart has stated that the result of breeding in hamsters was exactly opposite to that of rats. That is, late insemination gave a preponderance of female offspring and early insemination gave a preponderance of male offspring. The preponderance of male offspring in early insemination in hamsters ran up as high as 160 male per 100 female offspring, and the preponderance of female offspring in late inseminations ran as high as 170 to 100 male offspring.

2. There is no harm in the use of alkali or acid douches before coitus to alter the p_H of the vagina; neither is there any reported deleterious effect from the use of hormones on the offspring of human beings; there is no point, however, in using these substances to try to predetermine sex.

DETERMINING RACE OF FATHER OF INFANT

To the Editor:—Is there any laboratory test that will definitely determine whether or not a baby born of a white woman has a Negro father?

J. R. Lanier, M.D., Graymont, Ga.

ANSWER.—There is no blood test that can determine whether the baby's father is white or Negro. Blood tests may show that a certain man could not possibly be the father of a certain child.

VITAMIN B_{12} FOR PERNICIOUS ANEMIA

To the Editor:—Since vitamin B_{12} has been found effective in pernicious anemia, especially for the neurologic symptoms, may liver therapy be discontinued and vitamin B_{12} entirely substituted therefor? The patient has had pernicious anemia for three years, the last two years with decided neurologic involvement; he has been getting liver extract; for about two years the liver extract has been given by injection, 30 units each week. The blood picture returned to normal, but the neurologic involvement remained unchanged. During the past seven weeks he has received in addition 10 micrograms each week of a vitamin B_{12} preparation by injection; the only effect noticeable on the neurologic involvement is a return of great or moderate pain in the fingers and toes. Would it be safe to discontinue the liver extract injections and give only the vitamin B_{12}? If so, what dosages per week are advised.

M. Kovacik, M.D., Shidler, Okla.

ANSWER.—From present indications vitamin B_{12} is effective in controlling both the blood and neurologic changes in patients with pernicious anemia. It is not known whether liver extract has any additional properties or not. It would appear to be safe to use the vitamin B_{12} injections alone if proper blood and neurologic studies are made at intervals to note whether there are any deleterious changes. The vitamin B_{12} may be given weekly in doses of 10 micrograms intramuscularly.

REPAIR OF OLD HAND INJURY

To the Editor:—In an accident on Nov. 22, 1947, the left arm and hand of a 22 year old man were injured. On the dorsal surface of the wrist and the hand is a vast scar, irregular in shape and strongly adherent to the bony structures. The movements of the wrist are greatly diminished. The extensor tendons of the second, third and fourth fingers were destroyed for the length of 2 cm., from tearing of the tissue. This forces the three fingers into strong flexion and immobility. The extensor of the index finger is adherent to the scar, permitting only partial movement of the finger. There is a scar on the anterior region of the wrist. The flexor tendons of the first, second and third fingers are adherent to the scar. The flexor and the opponens of the thumb are interrupted by a cut, as of a knife, so that there is no destruction but simple interruption of the tendons. The aim of the surgical intervention should, therefore, consist in the possibility of transplanting (or something similar) the extensor tendons of the second, third and fourth fingers, which are in part destroyed, to reunite the two tendons of the thumb and to free the other tendons from the adhesions. The electrodiagnostic examination of the left arm and hand of the patient shows that the stimulation of Erb's point of the brachial plexus provokes a quick and strong contraction; the nerves and muscles of the forearm show a normal response. The methodic exploration of the nerve branches and of the muscles of the forearm shows diminished faradic and galvanic reaction of the anterior muscles, without any signs of degenerative reactions. The muscles of the hand, of both the thenar and hypothenar eminence, are almost irresponsive. A slow and torpid muscular contraction, with evident degenerative reaction, is observed only on the thenar eminence. The dorsal interossei do not respond to electric stimulation. The patient resides in Italy, where I have recently been. It seems that no one there can assure him a certain degree of improvement. His coming to this country entails expenses which could be covered if reasonable. Is there a possibility of even limited improvement?

Salvatore Cardi, M.D., West New York, N. Y.

ANSWER.—The patient, no doubt, has two types of lesions in the left wrist, they are nerve and tendon injuries. His original trauma occurred eighteen months ago, and many of the objective observations mentioned are due to vascular, neuritic and disuse changes. Because of the age of the patient, every effort should be made to give him all the help that is possible. It seems that he should be able to find a competent hand surgeon in France, Germany or Switzerland. If the patient is unable to find such competent man in Europe, he might then consult one in the United States. There are expert hand surgeons in Chicago.

SPINAL ANESTHESIA

To the Editor:—What advantage has continuous (fractional) spinal anesthesia as developed by Dr. William T. Lemmon over a single dosage spinal anesthesia in a hospital such as I practice in? It is a forty bed hospital with a staff of eight physicians, all general practitioners. The anesthesia is administered by the physicians. The abdominal operations performed consist of appendectomies, herniorrhaphies, hysterectomies and occasional gastric and bowel resections. I was of the opinion that continuous spinal anesthesia was safer and more dependable; however, the other physicians on our staff do not see any advantages in its use. Would you advise its introduction in our hospital?

M.D., New Mexico.

ANSWER.—The method of continuous spinal anesthesia allows long periods of anesthesia with more safety than anesthesia with a single dose. Therefore, the method should be given a trial in your institution, as that is about the only certain way to answer your question. If your operating table does not permit use of the special pad necessary when Lemmon's (*Ann. Surg.* **3**:141 [Jan.] 1940) method is used, then you should consider using the catheter technic developed by Tuohy (*Anesthesiology* **5**:142 [March] 1944), in which a special mattress is not needed.

TOXICITY OF CERESAN M®

To the *Editor*:—A patient complains of burning of the eyes and discharge of pus from the eyes. He has treated himself with some mercury preparation for the past year. He has no pep or energy. His weight has decreased from 175 pounds (79 Kg.), his average, to 152 pounds (69 Kg.) within one and one-half years. He has had bleeding from the gums, and in the morning after awaking he coughs up dark red sputum. A chest roentgenogram did not reveal signs of disease. The eyes are slightly reddened and there are a small hordeolum on the left lid, small amount of discharge on both lower lids and some redundancy of the lower lids. The results of the rest of the physical examination were normal except for the gums. This patient has been exposed to ceresan M® (active ingredient, ethyl mercury *p*-toluene sulfonanilide) at various intervals for the past one and one-half years and says that he smells it in the air at different times. He wears a mask but does not cover his eyes or hands when using the product. Please give information on chronic poisoning from exposure to this product and the symptoms, diagnosis and treatment.

C. H. Mahaffey, M.D., Barron, Wis.

ANSWER.—The chronic toxicity of ceresan M® is essentially the same as that for mercury vapor. In the early stages symptoms similar to those caused by the ingestion of mercury salts may be expected. Stomatitis, gastrointestinal disturbances and soreness of the gums are familiar signs. The higher centers may be involved in more severe types of chronic poisoning, characterized by nervousness, apprehension, tremors and varying degrees of personality changes. Direct contact of ceresan M® with the eyes may cause irritation.

Since the patient has treated himself with some mercury preparation for the past year, it would be extremely difficult to distinguish between the effects of self medication and those of occupational exposure to ceresan M.® Treatment should involve the immediate cessation of self medication and removal from all contacts with mercury compounds in any form. A satisfactory dietary and oral hygienic regimen should be established.

DUST SEAL®

To the *Editor*:—I have read of the use of dust seal® for eliminating house dust. Has this preparation been approved? Is it effective? Who makes it?

M.D., Indiana.

ANSWER.—Dust seal® is an absorptive emulsion which prevents the spread of house dust. Experiments in the last war indicated that the concentration of air-borne bacteria was reduced when absorptive oils were used in hospitals and barracks. The manufacturers of dust seal® (L. S. Green Associates, 160 West 59th Street, New York) modified the materials used in wartime so that it might be used on furniture, carpets and drapes in the home.

The only study of this product, reported in medical writings, is by A. F. Coca (*Ann. Allergy* **6**:506 [Sept.-Oct.] 1948). The author reported that he obtained favorable results in 6 patients sensitive to house dust. Unfortunately, patients were studied primarily with Coca's limited and not generally accepted technic (pulse rate and blood pressure changes). However, the subjective improvement reported is important.

PARA-AMINOBENZOIC ACID FOR PREVENTION OF SUNBURN

To the *Editor*:—Please send me information on sunburn preventives. Can para-aminobenzoic acid be used alone or in combination with an ointment? Is it as effective as tannic acid? In what ointment is it best used and in what percentage?

M.D., New York.

ANSWER.—Para-aminobenzoic acid (PABA) currently is thought to be the most satisfactory of the sunburn preventives because it is colorless, odorless, readily miscible in different types of vehicles and is less likely than tannic acid, quinine or phenyl salicylate to produce irritation of the skin. On rare occasions, however, it, too, is capable of provoking contact dermatitis, and there is reason to believe from experimental work that allergic reactions may occur on the basis of cross sensitization with sulfonamide drugs and other chemicals. PABA is usually used in concentration of 15 per cent incorporated in almost any convenient vehicle—vanishing cream, cold cream, emulsion base or 70 per cent alcohol.

ATROPHY OF OVARIES

To the *Editor*:—Does subtotal hysterectomy decrease the blood supply to the ovaries and thus help to promote their atrophy?

Robert A. Hosbour, M.D., Compton, Calif.

ANSWER.—Subtotal hysterectomy seldom decreases the blood supply to the ovaries. There is an ample supply of blood to the ovaries through the ovarian arteries, so atrophy does not occur following a hysterectomy.

VAGINAL EXAMINATION BEFORE CESAREAN SECTION

To the *Editor*:—In what situations would it be necessary to do a vaginal examination to determine the necessity of performing a cesarean section at term? Is this a dangerous procedure today with the presence of antibiotics?

Robert A. Hosbour, M.D., Compton, Calif.

ANSWER.—There is no harm in making a vaginal examination before a cesarean section if the examination is made under sterile precautions and without trauma. In all cases of doubt, one should not rely entirely on rectal examinations but should make a vaginal examination. If more than one is made before delivery, antibiotics should be given. Certainly if the technic of making a vaginal examination is poor, there is some slight risk of infection. In such cases, antibiotics should be given as soon as the patient is seen and for two or three days after delivery.

HISTAMINE CEPHALALGIA

To the *Editor*:—Please outline the latest therapy for histamine cephalalgia (or "Horton's headache"). The nasal congestion, severe lancinating headache, edema of eyelid and conjunctivitis. Various antihistaminics, ergotamine tartrate with caffeine and narcotics have not provided relief.

M. Halparin, M.D., Harrowsburg, N. Y.

ANSWER.—The following treatment schedule has been developed for histamine cephalalgia: The initial subcutaneous dose of histamine diphosphate is 0.25 cc. Each subsequent dose is increased 0.05 cc. to the sixteenth injection; 1 cc. then is administered for the next four and subsequent doses. Two injections are given daily for approximately ten days to three weeks. Reactions, such as flushing of the face, can be controlled by cutting the ensuing dose in half. The dose gradually is increased again. A maintenance dose of 1 cc. histamine diphosphate one to three times weekly may be necessary to maintain improvement in some patients.

VACCINATION AGAINST TUBERCULOSIS

To the *Editor*:—THE JOURNAL editorial "The Program of the World Health Organization" contains reference to a mass immunization program for the prevention of tuberculosis. Will the children of immunized parents be sensitized to tuberle bacilli? If those who are vaccinated are infected, will they have the adult type of infection?

George C. Parr, M.D., Clarksdale, Miss.

ANSWER.—So far as is known, the children of vaccinated parents will not be affected by the vaccination. If infection recurs, most of those vaccinated will have an adult type of reaction. Nevertheless, as with any mild tuberculous infection that heals completely, there is observed occasionally a reaction that simulates the primary infection. This is known as a reinfection complex. An important feature of vaccination seems to be a tendency for the bacilli to remain localized.

NEWCASTLE DISEASE

To the *Editor*:—In Queries and Minor Notes Oct. 15, 1949, page 499, a question concerning the nature of Newcastle Disease is answered by stating that this disease manifests itself as unilateral purulent conjunctivitis without corneal involvement or as a syndrome consisting of conjunctivitis, preauricular lymphadenitis, headache, malaise and chills, without significant rise in temperature. Three proved cases are described occurring in laboratory workers handling the virus. In a recent report Hewitt, Bishop and Kissling (Amer. J. Pub. Health 38: 1363, 1948) demonstrated significant rises in titers of Newcastle virus neutralizing antibodies in serums collected in 1947-1948 from various groups of children in Alabama and Tennessee suffering from mild encephalitis and encephalitis poliomyelitis-like symptoms. These children had a frequent history of association with sick chickens with similar antibodies. Furthermore, in 6 laboratory workers there developed an acute influenza-like infection soon after they worked with the virus. Subsequently tests showed high titers of specific neutralizing antibodies during convalescence.

Hewitt and her co-workers suggest that the virus of Newcastle disease of fowls was probably the agent responsible for many cases of atypical meningoencephalitis infections that have been reported particularly in Southern communities during the past few years. They also suggest that, as in the fowl, manifestations are chiefly neurologic in children and more influenza-like in adults. Newcastle disease in man will probably become increasingly important to physicians in the future because recent systematic surveys (Bull. Bureau of Animal Ind. July 1, 1948) have demonstrated the presence of this virus infection in poultry flocks in all but four states in this country. A hemagglutination inhibition test similar to the one used for influenza and mumps virus diagnosis can also be employed for laboratory diagnosis in addition to the neutralization test referred to in THE JOURNAL. However, the results of these tests in man must be interpreted with caution in the absence of virus isolation because Junghare and others (Science 110: 330 [Sept.] 1949) have recently reported that many mumps convalescent phase serums apparently also contain both types of Newcastle antibodies.

Albert Miller, M.D.,
Michael Reese Hospital, Chicago.